ANDREYEV, Andrey Alekseyevich DECEASED

c'1962

1963/1

STEEL INDUSTRY

see ILC

ANDR[illegible]YEV, A.

Highway transport workers of White Russia solve the problems of the seven-year plan. Avt.transp. 40 no.10:1-3 O '62.
(MIRA 15:11)

1. Nachal'nik Glavnogo upravleniya avtomobil'nogo transporta pri Sovete Ministrov Belorusskoy SSR.
(White Russia--Transportation, Automotive)

GIBSHMAN, Aleksandr Yevgen'yevich, doktor tekhn. nauk, prof.; BALAYEVA, Konkordiya Aleksandrovna, kand. tekhn. nauk; KOLOMEYETS, Aron Vol'fovich, kand. tekhn. nauk, dots. Prinimal uchastiye ANDREYEV, A.A., inzh.-ekonomist; SAVEL'YEV, A.V., inzh., retsenzent; MALI-MANOV, Yu.I., inzh., red.; KHITROV, P.A., tekhn. red.

[Cutting the costs of construction work in the electrification of railroads] Snizhenie stoimosti stroitel'nykh rabot pri elektrifikatsii zheleznykh dorog. Moskva, Vses. poligr. ob"edinenie M-va putei soobshcheniia, 1961. 123 p. (MIRA 14:10)
(Railroads—Electrification) (Railroads, Electric—Cost of construction)

ANDREYEV, A.A.

Creation of a new industrial district on the lower Volga. Prom. stroi. 40 no.8:3-4 '62. (MIRA 15:11)

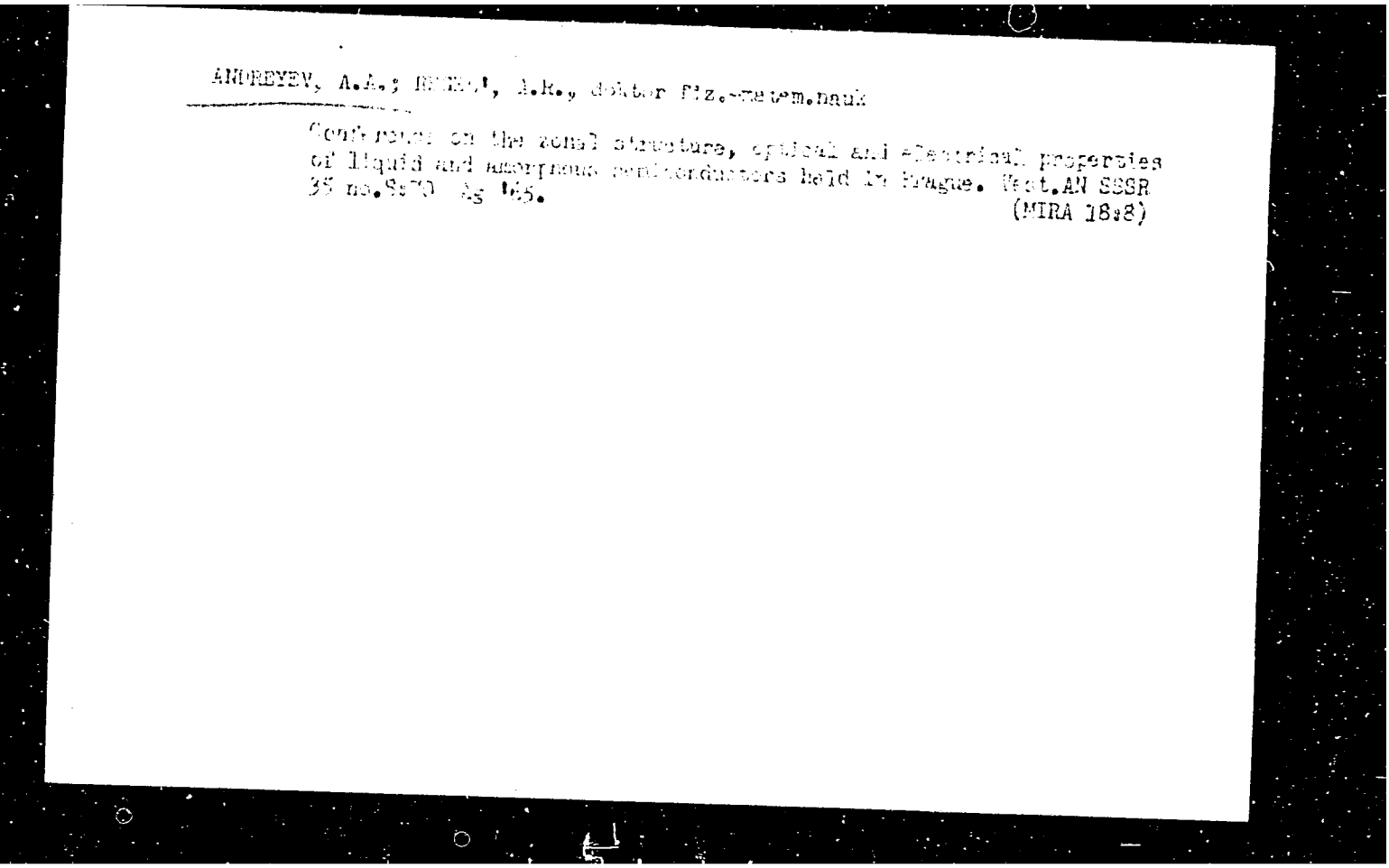
1. Zamestitel' predsedatelya Volgogradskogo soveta narodnogo khozyaystva.
(Volgograd Province—Construction industry)

ANDREYEV, A.A., inzhener-ekonomist

Investigating the use of basic construction machinery in the construction of the roadbed. Trudy MIIT no.162:83-95 '63.
(MIRA 17:4)

ANDREYEV, A.A.; SHMATKO, A.G.

Starting up and operating the Zhuliai intermediate station of the [redacted] Petroleum Pipeline. Neft.khoz. 42 no.4:57-60 Ap '64.
(MIRA 17:9)



ANDREYEV, A.A.; [illegible], A.K., doktor fiz.-matem.nauk

Conference on the zonal structure, optical and electrical properties of liquid and amorphous semiconductors held in Prague. Vest.AN SSSR 35 no.8:70 Ag '65. (MIRA 18:8)

ANDREYEV, Atanas A.; KIPERMAN, S.L.

Kinetics of cyclohexane dehydrogenation in a gradientless system. Part 1. Kin.i kat. 6 no.5:869-877 S-O '65.
(MIRA 18:11)

1. Institut organicheskoy khimii imeni Zelinskogo AN SSSR.

ANDREYEV, A.A.

[Standard plan of a hydrolysis-yeast plant with a yearly capacity of 28, 000 tons of dry yeast] Tipovoi proekt gidrolizno-drozhzhevogo zavoda moshchnost'iu 28 tysiach tonn sukhikh drozhzhei v god. Moskva, TSentr. nauchno-issl. in-t informatsii i tekhniko-ekon. issledovanii po lesnoi, tselliulozno-bumazhnoi, derevoobrabatyvaiushchei promyshl. i lesnomu khoz., 1964. 26 p. (MIRA 18:6)

L 8504-66 EWT(m)/EWP(v)/EWP(j)/T/ETC(m) WW/RM

ACC NR: AP5028477 SOURCE CODE: UR/0286/65/000/020/0063/0063

AUTHORS: Ratner, I. S.; Volovich, Z. M.; Baklanov, G. M.; Kulakovskiy, V. A.; Gorskiy, B. Z.; Volk, A. I.-Kh.; Andreyev, A. A.; Arkadzhovskiy, V. N.; Timofeyev, N. Ya.; Meytin, R. Ya.

ORG: none

TITLE: A device for saturating fibrous reinforcing materials with a binder. Class 39, No. 175641

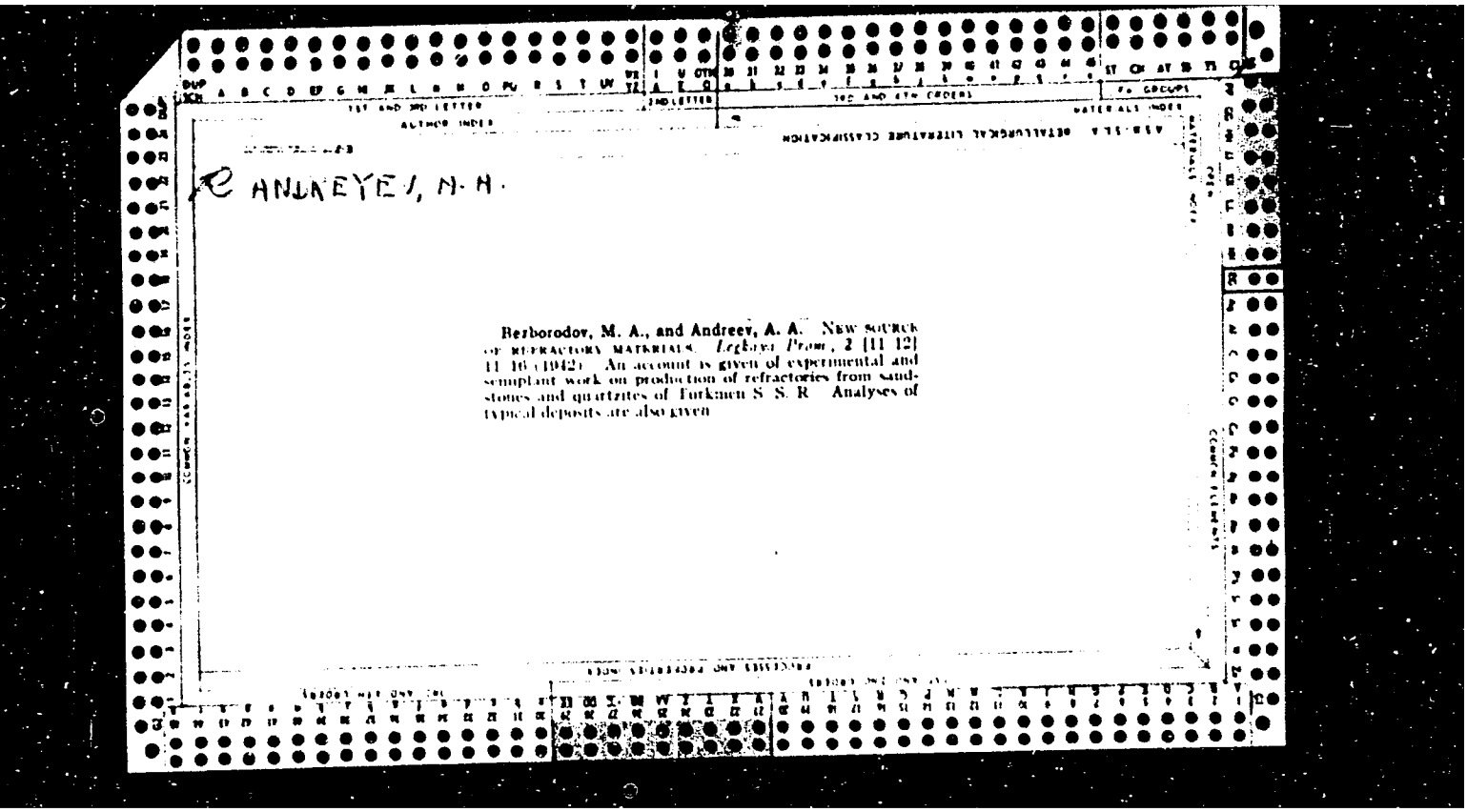
SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 20, 1965, 63

TOPIC TAGS: bonding material, industrial instrument, mechanical motion instrument

ABSTRACT: This Author Certificate presents a device for saturating fibrous reinforcing materials with a binder. The device contains a mechanism for moving the material over a rigid base and a working percussion instrument. The latter is set into reciprocating motion in a plane normal to the motion of the material. To increase the productivity of the device while improving the saturation quality, the working instrument consists of spring-loaded plates mounted on a common traverse. Elastic supports are fixed to that side of the plates which is toward the material being worked.

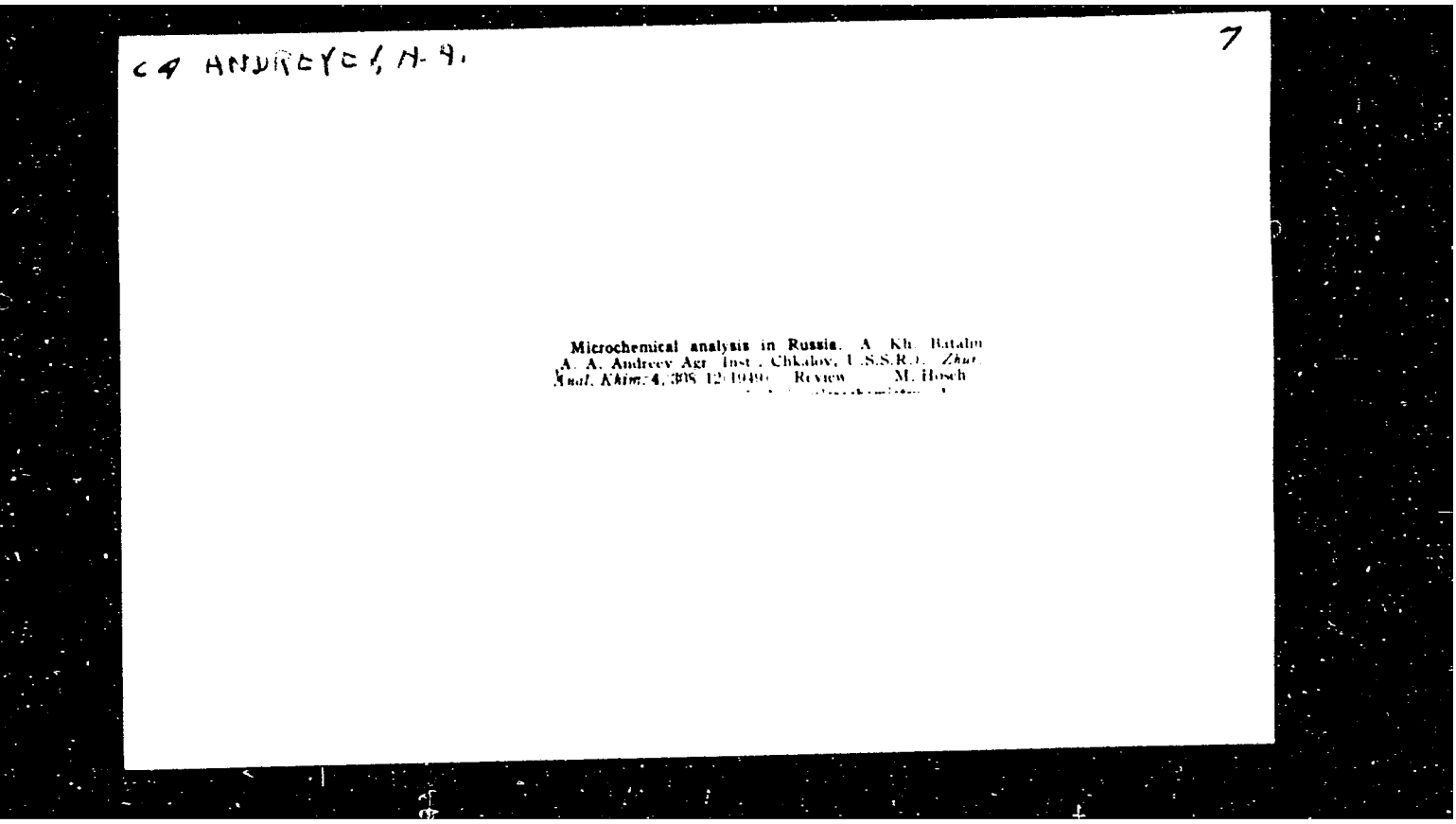
SUB CODE: 13/ SUBM DATE: 15Dec62

Card 1/1 UDC: 678.026.2



ANDREYEV, N. N.

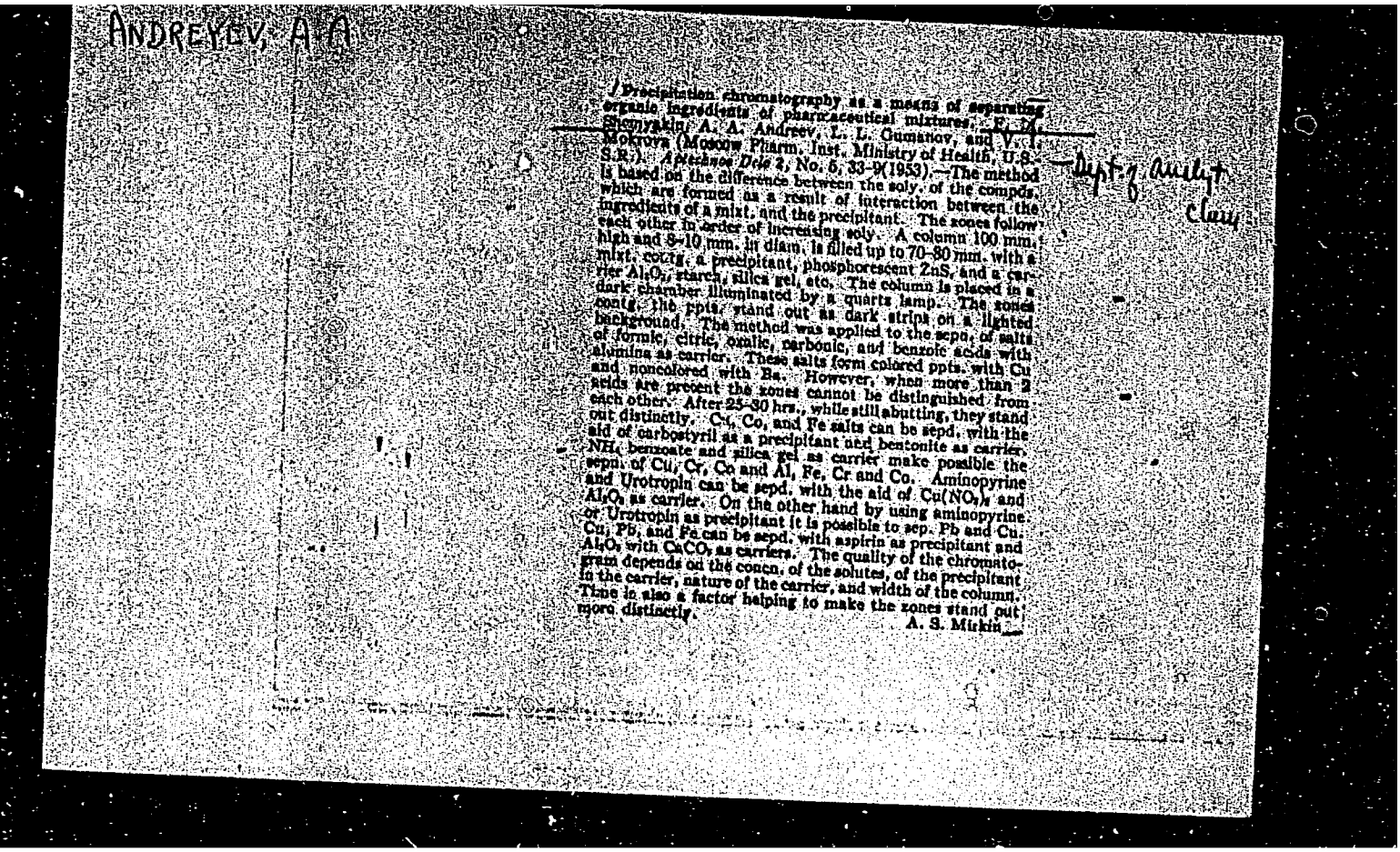
Bezborodov, M. A., and Andreev, A. A. NEW SOURCE OF REFRACTORY MATERIALS. *Legkaya Prom.*, 2 [11 12] 11 16 (1942). An account is given of experimental and semiplant work on production of refractories from sandstones and quartzites of Turkmen S. S. R. Analyses of typical deposits are also given



CA ANDREYC, N. 9.

7

Microchemical analysis in Russia. A. Kh. Batalin
A. A. Andreev Agr. Inst., Chkalov, U.S.S.R.). *Zhur. Anal. Khim.* 4, 305-12 (1949). Review. M. Hosch



ANDREYEV, A.A.

Dept. Analyt. Chem.

/Precipitation chromatography as a means of separating organic ingredients of pharmaceutical mixtures. E. D. Shevyrkin, A. A. Andreev, L. L. Gumanov, and V. I. Mokrova (Moscow Pharm. Inst. Ministry of Health, U.S.S.R.). *Aptechnoe Delo* 2, No. 5, 33-9(1953).—The method is based on the difference between the soly. of the compds. which are formed as a result of interaction between the ingredients of a mixt. and the precipitant. The zones follow each other in order of increasing soly. A column 100 mm. high and 8–10 mm. in diam. is filled up to 70–80 mm. with a mixt. contg. a precipitant, phosphorescent ZnS, and a carrier Al_2O_3, starch, silica gel, etc. The column is placed in a dark chamber illuminated by a quartz lamp. The zones contg. the ppts. stand out as dark strips on a lighted background. The method was applied to the sepn. of salts of formic, citric, oxalic, carbonic, and benzoic acids with alumina as carrier. These salts form colored ppts. with Cu and noncolored with Ba. However, when more than 2 acids are present the zones cannot be distinguished from each other. After 25–30 hrs., while still abutting, they stand out distinctly. Ca, Co, and Fe salts can be sepd. with the aid of carbostyril as a precipitant and bentonite as carrier. NH_4 benzoate and silica gel as carrier make possible the sepn. of Cu, Cr, Co and Al, Fe, Cr and Co. Aminopyrine and Urotropin can be sepd. with the aid of $Cu(NO_3)_2$ and Al_2O_3 as carrier. On the other hand by using aminopyrine or Urotropin as precipitant it is possible to sep. Pb and Cu. Cu, Pb, and Fe can be sepd. with aspirin as precipitant and Al_2O_3 with $CaCO_3$ as carriers. The quality of the chromatogram depends on the concn. of the solutes, of the precipitant in the carrier, nature of the carrier, and width of the column. Time is also a factor helping to make the zones stand out more distinctly.

A. S. Mirkin

ANDREYEV, A.A.

Continuous washing process for yeast separation. Gidrolis.i lesokhim.prom.8 no.5:21-22 '55. (MLRA 9:1)

1.Nachal'nik spirtovogo zavoda Vyborskogo tsellyulozno-bumazhnogo kombinata.
(Yeast)

ANDREYEV, A. A.

USSR/Chemical Technology - Chemical Products and Their Application. Wood Chemistry Products. Cellulose and Its Manufacture. Paper, I-23

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 63353

Author: Buyevskiy, A. V., Galakhova, V. Ye., Andreyev, A. A., Ivanova, Ye. A.

Institution: None

Title: Combined Withdrawal of Liquor from Cooking Vessels and Decanters

Original Periodical: Gidroliznaya i lesokhim. prom-st', 1956, No 2, 18-19

Abstract: On combined withdrawal of liquor (drawing off a portion of concentrated liquor from cooking vessels and the remainder from decanters) yield of alcohol per one t of cellulose was 70 l in lieu of 54-58 l. At the same time duration of liquor removal from cooking vessels has been decreased from 2 to 1.5 hours. Total volume of liquor is 9 m^3 per ton of cellulose with average sugar concentration of 2.1%. These results were attained on partial effectuation of the scheme of combined draw off procedure and operation schedule.

Card 1/1

ANDREYEV, A.A.

Whirling purifier in place of settling tanks. Gidroliz. i lesokhim. prom. 9 no.6:20-21 '56. (MLRA 9:10)

1.Spirtovyy zavod Vybergskogo TsBK.
(Separators (Machines))

ANDREYEV, A.A.

Defects of the separators of the Bolshevskiy Plant. Gidroliz. i lesokhim. prom. 9 no.7:20 '56. (MIRA 12:3)

1. Nachal'nik spirtovogo zavoda Vyborskogo tsellyulozno-bumazhnogo kombinata.
(Separators (Machines)) (Yeast)

ANDREYEV, A.A.

Effect of aspen wood on the quality of sulfite lyes. Bum.prom. 32 no.2:15-16 F '57. (MLRA 10:5)

1.Nachal'nik spirtozavoda Vyborgskogo tsellyulozno-bumazhnogo kombinata.

(Aspen) (Sulfite liquor)

ANDRKYEV, A.A.

Mechanical controlling of yeast foam. Gidroliz. i lesokhim. prom. 11 no.2:21-22 '58. (MIRA 11:3)

1. Vyborgskiy sul'fitno-spirtovoy zavod.
(Foam) (Yeast)

ANDREYEV, A.A.

Higher level of socialist competition. Gidroliz. i lesokhim. prom. 11 no.3:13-14 '58. (MIRA 11:5)

1. Nachal'nik spirtovogo zavoda Vyborgskogo tsellyulozno-bumazhnogo kombinata.

(Vyborg--Alcohol) (Vyborg--Yeast)

ANDREYEV, A.A.

Establishing an organization responsible for starting and adjusting new enterprises in the hydrolysis industry. Gidroliz.i lesokhim.prom. 15 no.3:31-32 '62. (MIRA 15:5)

1. Nachal'nik tekhnologicheskogo otdela gidroliznoy promyshlennosti Gosudarstvennogo institut po proyektirovaniyu predpriyatiy tsellyuloznoy i bumazhnoy promyshlennosti.
(Hydrolysis)

ALEKSEYEV, A.F.; MYSHKOV, L.A.; [illegible]TINA, T.I., red.

[Standard designs of high-capacity hydrolysis yeast plants] Tipovye proekty gidroliznc-drozzhzhovykh zavodov bol'shoi moshchnosti. Moskva, 1963. 35 p. (MIRA 17:8)

1. Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut informatsii i tekhniko-ekonomicheskikh issledovaniy po lesnoy, tsellyulozno-bumazhnoy, derevoobrabatyvayushchey promyshlennosti i leshozu khozyaystvu.

ANDREYEV, A.A.

Increase the efficiency of the results of research work.
Gidroliz. i lesokhim. prom. 16 no.6:1-3 '63. (MIRA 16:10)

1. Gosudarstvennyy institut po proyektirovaniyu gidroliznykh zavodov.

ANDREYEV, A.A.

Eliminate the shortcomings in the organization of new yeast plants. Gidroliz. i lesokhim. prom. 16 no.7:3-6 '63. (MIRA 16:11)

1. Gosudarstvennyy institut po proyektirovaniyu gidroliznykh zavodov.

L 23012-66 EWT(d)/EWT(m)/EWP(v)/T/EWP(k)/EWP(h)/EWP(l) DJ
ACC NR: AP6007669 SOURCE CODE: UR/0413/66/000/003/0040/0040

AUTHOR: Andreyev, A. A.

ORG: none

TITLE: Welding manipulator. Class 21, No. 178428

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 3, 1966, 40

TOPIC TAGS: welding equipment, automatic welding

ABSTRACT: An Author Certificate has been issued for a welding manipulator consisting of a turning device and a positioner. To provide continuous semiautomatic welding of curvilinear joints of intricate shape, the driven shaft of the rotational device is equipped with a duplicate cam interacting through a roll with a rack linkage whose gear is mounted on the same shaft, as the face plate which secures the joint to be welded (see Fig. 1). Orig. art. has: 1 figure. [LD]

Card 1/2 UDC: 621.791.077

L 23012-66

ACC NR: AP6007669

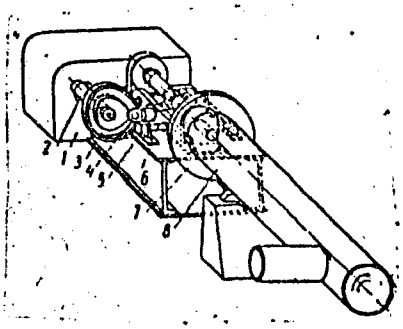


Fig. 1. Welding manipulator. 1 - rotational device; 2 - driven shaft; 3 - duplicator; 4 - roll; 5 - rack; 6 - gear; 7 - face plate; 8 - joint to be welded.

SUB CODE: 13/ SUBM DATE: 16Jan63/

Card 2/2 IC

ACC NR: AP7005880 SOURCE CODE: UR/0181/66/008/012/3681/3683

AUTHOR: Andreyev, A. A.; Regel', A. R.

ORG: Institute of Semiconductors, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

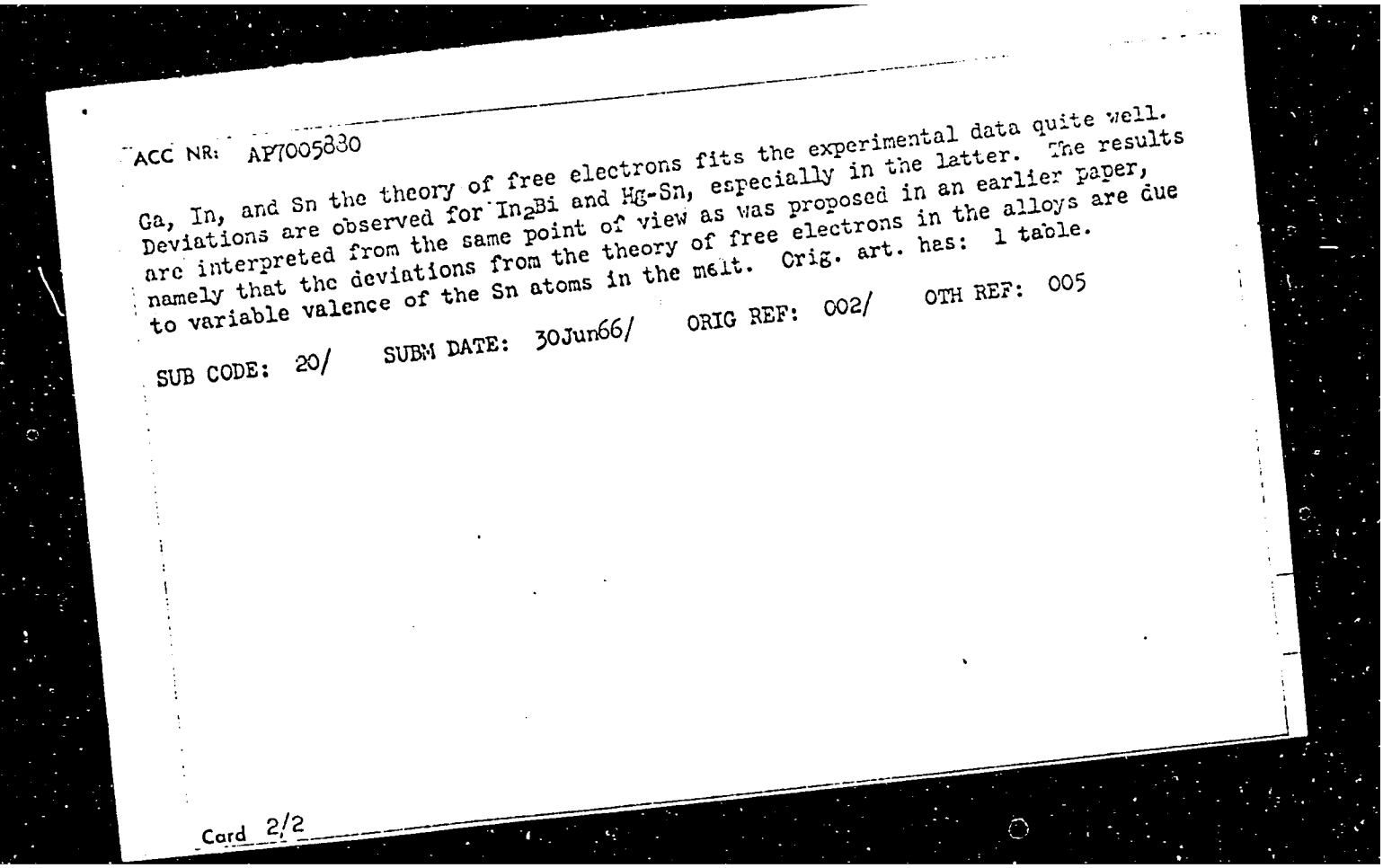
TITLE: Hall coefficient in the liquid metals Hg, Ga, In, and Sn and in the alloys In_2Bi and Hg-Sn

SOURCE: Fizika tverdogo tela, v. 8, no. 12, 1966, 3681-3683

TOPIC TAGS: Hall effect, liquid metal indium alloy, mercury alloy, tin containing alloy, bismuth containing alloy, free electron, chemical valence

ABSTRACT: This is a continuation of earlier work (FTT v. 7, 2567, 1965), where deviations from the theory of free electrons were observed for Hg-Tl alloys, in the value of the Hall coefficient, from that predicted in the model of free electron theory. In the present paper the authors present the results of measurements of the absolute values of the Hall coefficient for a number of liquid metals and alloys, carried out with accuracy not worse than 5%. To ensure high accuracy, the inhomogeneity of the magnetic field along the sample was not higher than 0.3% at 1.8 kOe. The inhomogeneity in the current density was not higher than 2%. The Hall signal was measured by a method using an alternating current and an alternating magnetic field. A table of the Hall coefficients obtained in the measurements and of those obtained from the theory of free electrons is presented and it is shown that for Hg,

Card 1/2



ACC NR: AP7005830

Ga, In, and Sn the theory of free electrons fits the experimental data quite well. Deviations are observed for In_2Bi and Hg-Sn, especially in the latter. The results are interpreted from the same point of view as was proposed in an earlier paper, namely that the deviations from the theory of free electrons in the alloys are due to variable valence of the Sn atoms in the melt. Orig. art. has: 1 table.

SUB CODE: 20/ SUBM DATE: 30Jun66/ ORIG REF: 002/ OTH REF: 005

Card 2/2

ANDREYEV, A.A.

"The theory, Calculation and Design of An Installation for Regulating with a balance Bridge."

Precision Industry, 1935, no. 3, p.8-11 3 ill. no. 4 p.4 7 ill.

SOV/124-58-3-2639

Translation from: Referativnyy zhurnal, Mekhaniak, 1958, Nr 3, p 14 (USSR)

AUTHOR: Andreyev, A. A.

TITLE: Analytical Determinations of Certain Questions Applying to the Kinematics of Wheels in Agricultural Machinery (Analiticheskaya razrabotka nekotorykh voprosov kinematiki koles sel'skokhozyaystvennykh mashin)

PERIODICAL: V kn.: Sb. trudov po zemledel'cheskoy mekhanike. Moscow Sel'khozgiz 1954. Vol 2 pp 3-12

ABSTRACT: Using as basis the work of V. P. Goryachkin and V. A. Zheligovskiy on the theory of the wheel, the author presents an analytical solution of the problem of the direction of the crushing of the soil and the reaction of the rut against the driving as well as the driven wheel. Formulae are derived for the deviations of these parameters from the normal to the rim in various sectors of the wheel rim.

N. P. Rayevskiy

Card 1/1

ANDREYEV, A.A., inzhener, redaktor; MARTENS, S.L., inzhener, redaktor izdatel'stva; MATVEYEVA, Ye.N., tekhnicheskiy redaktor

[Automatic electronic potentiometers and balanced bridges; a catalog and reference manual] Avtomaticheskie elektronnye potentsiometry i uravnoveshennye mosty; katalog-spravochnik. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1955. 111 p. (MLRA 9:10)

1. Russia (1923- U.S.S.R.) Glavpribor.
(Potentiometer) (Electric apparatus and supplies)

ANDREYEV, A.A.

New automatic electronic instruments designed by the State Union special-Design Bureau of the Main Instrument Administration. Priborostroenie no.2:15-20 F '56. (MLRA 9:8)
(Electronic instruments)

SOV/119-59-9-2/19

9(4)
AUTHORS: Andreyev, A. A., Engineer, Nikolayenko, N. S., Engineer

TITLE: Semiconductor Amplifiers for Automatic Measuring Devices

PERIODICAL: Priborostroyeniye, 1959, Nr 9, pp 6-8 (USSR)

ABSTRACT: In circuits of automation and control technique semiconductor diodes and triodes practically always replace vacuum tubes. Investigations made in the design office showed the possibility of using a scheme with direct coupling. In this connection the theoretical and experimental advantages of this type of circuit with inductance and capacity coupling were proved. In extension of work in this direction the design office developed amplifiers for automatic devices the output of which is connected to a reversive motor. These amplifiers have a simple and elegant circuit arrangement, and are highly sensitive and reliable in operation. To begin with, semiconductor amplifiers for alternating current were discussed. This apparatus is intended for use in automatic equipment, which measures physical parameters transformed into a.c.-signals. Apparatus of this type are, e.g. automatic bridges, potentiometers for a.c., induction instruments, etc. The amplifiers are suitable for Geiger-instruments

Card 1/3

and for recorders of all the calibrations provided by the GOST (All-Union State Standard). The circuit diagram of the amplifier is illustrated in a figure. The amplifier consists of 6 cascades. The authors then describe certain details of the circuit arrangement. The problem of stabilizing the temperature in circuits with direct coupling had been solved previously. The correctness of these deductions was proven experimentally for a circuit consisting of 5 cascades. The input amplifier was calculated by means of graphical-analytical methods. The sensitivity of the amplifier was controlled by means of an alternating-current resistance interconnected between the emitter and the base of the triode of the third cascade. The output cascade was also calculated by graphical-analytical methods, and its efficiency amounted to ~70%. Thus semiconductor triodes were applicable down to stray power of less than 1 w. The amplifier in question had a sensitivity threshold of approximately 1 microwatt at an input resistance of around 1,000 ohm. Thus an electric power of 10^{-15} w enters the amplifier. Apparatus equipped with specimens of this amplifier fit well into the 0.5 class. The semiconductor amplifier is

adapted for operation in a surrounding medium at 0 - 60°C, performanoe being most dependable when maintained constantly in a medium at 60° C. The tests carried out in a factory gave good results. No trouble during operation has been experienced hitherto. The second part of the paper deals with a semiconductor amplifier for direct current, which is intended for use in automatic potentiometers and in d.c. bridges. It is distinguished from the above amplifier by containing a small size electromechanical oscillation transformer. The circuit diagram of the automatic recording potentiometer is given in a figure. This semiconductor amplifier is composed of miniatur wireless parts, and contains miniature transformers, which were developed and produced in the design office. The semiconductor amplifier surpasses electronic amplifiers concerning all parameters. Besides, semiconductor amplifiers are ready for use practically immediately. At present the design office is testing a semiconductor amplifier having a feed back concerning speed, which is adapted for use in automatic recorders. The laboratory tests gave good results. There are 3 figures and 1 table.

31500

S/119/60/000/009/001/001
B116/B206

9,2300 (1153,1160,1161,1385)

AUTHOR: Andreyev, A. A., Engineer and Butusov, I. V., Engineer

TITLE: Automatic electronic miniature self-recorders

PERIODICAL: Priborostroyeniye, no. 9, 1960, 13 - 16

TEXT: A newly developed group of automatic electronic miniature devices for controlling temperature, pressure, quantity, level etc. is described. They are: the potentiometers ПСМР2 (PSMR 2), bridges МСМР2 (MSMR 2) and devices with the differential transformer measuring circuit ДСМР2 (DSMR 2). The main characteristic data of the devices are: basic error in % of the upper measuring range: ±1; error of the telemeter maximum ±0.5%; length of scale and width of strip-chart: 100 mm; external dimensions: 166·186·440 mm; mains supply: a. c. 127 v and 50 cycles. Changes of the supply voltage by ±10% and of the frequency by ±5% cause no additional errors. The mode of action of the devices is based on compensation measurement with automatic balancing. In the first two devices the

Card 1/

measured values are balanced by means of slide wires, in the third device by displacing the plunger of the differential-transformer coil. The PSMR 2-device (Fig. 1) consists of the compensation measuring circuit I with the remote control device, the stabilized d. c. supply source II, the zero indicator III as well as the indicating and recording device. Besides, either a rheostat-reference input element (reostatnyy zadatchik) or a position-control device are incorporated in the devices for controlling the controlled variable. The installation for supervising the device consists of the switch K and R_{11}, R_{12}. When pressing the button K, the ends of the thermocouple III and R_1 are short-circuited. R_4-R_5 are simultaneously shunted by R_{11}. A voltage is applied to the amplifier input by means of R_{12} when the pickup circuit is broken. The slide wire R_{13} and the trimmer capacitors R_{14} and R_{Λ} belong to the remote indication device. The mode of action of the supply source II is as follows. The alternating voltage of the secondary winding of the transformer T_1 is rectified by the bridge rectifier with germanium diodes ДГ-Ц27 (DG - Ts27) and applied to the T shaped filter R_{15}, R_{16} and C_1). The rectified and filtered voltage is stabilized by the gas stabilizer 1 and filtered again by a second T

31500

S/119/60/000/009/0[illegible]/008
B116/B206

Automatic electronic miniature. . .

shaped filter (R_{17}, R_{18} and C_1). The semi-variable resistance R_{19} and the variable resistance R_{20} serve for controlling the output voltage. The zero indicator III is an electronic a. c. amplifier with the two-phase induction motor 2. The convertor cascade consists of the single pole electromagnetic convertor 3 with the input transformer T_2. The device operates in the following way: The measured thermo emf of the thermocouple ТП is compared with the voltage drop in the section of the slide wire R. If the two are not equal, the difference is applied to the amplifier input as an unbalance signal. This signal voltage, converted and amplified by the amplifier, causes a rotation of the motor 2. This displaces the slide of the slide aire into equilibrium position, for which no difference exists between thermo emf and the voltage drop at the slide wire. Together with the slide of the slide wire, the carriage with the stylus and the indicator is also displaced, so that the measured value may be read continuously. Simultaneously with the slide of the slide wire, the discs of the position control device, or the slide of the rheostat-reference input element are displaced. The MSMR2-device (Fig. 2) consists of a balanced bridge measuring circuit with a telemeter, the zero indicator,

Card 3/[illegible]

Automatic electronic miniature...

the indicating- and recording device and the installation for supervising the device Besides, either a position control device or a rheostat-reference input element are incorporated. The operation of the second bridge is based on measuring the resistance R_T of the thermometer which is connected to one arm of the bridge. The bridge is balanced by means of the slide wire R. The zero indicator is an electronic a. c. amplifier II K is the switch of the installation for supervising the device. The DSMR2-device (Fig 3) consists of the measuring circuit I with telemeter and supervision installation, the amplifier II and the indicating- and recording device. To the measuring circuit belong the transformer coil 1, the pickup and the coil 2 of the secondary device with the movable plungers. The primary windings of both coils are connected in series and are supplied by the winding of the power transformer T_P. The correcting coil 3 serves for zero correction. It is connected in series with the other coils. The plunger of the coil in the device is displaced by means of the cam disc [illegible]. To every position of the pickup coil plunger corresponds a certain position of the plunger in the coil of the secondary device, which is connected with the stylus and the indicator.

Card 4/[illegible]

24.2100 (1035,1043,1158)

S/181/60/002/011/016/042
B006/B056

AUTHORS: Andreyev, A. A. and Regel', A. R.

TITLE: Electrical Conductivity of Liquid Selenium in Strong Electric Fields

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 11, pp. 2770-2775

TEXT: The authors investigated the electrical conductivity of liquid selenium in fields of up to 10^5 v/cm in the temperature interval of 180-350°C. The basic circuit diagram of the experimental arrangement used for this purpose is shown in Fig. 1. They studied pure (99.99%) and commercial selenium which is known to contain chlorine impurities, as well as selenium with iodine impurities (up to 1%). An investigation of the effect of iodine impurities upon the electrical conductivity of liquid selenium showed that an addition of ≃0.3% iodine corresponds to the maximum field effect. The dependence of the electrical conductivity on the electric field strength agrees with Frenkel's formula for fields $>10^4$ v/cm, and is found to be an extrapolation of the data of the analogous effect in amorphous selenium. The experimental results are given in diagrams and tables. Fig. 3 shows

Electrical Conductivity of Liquid Selenium in Strong Electric Fields

S/181/60/002/011/016/042
B006/B056

the typical course taken by the E-dependence of the relative changes of resistivity $\Delta R/R_o$, where ΔR is the field-induced decrease in resistivity of the specimen, and R_o is the resistivity in a field that is smaller than the critical field or with $E > 0$. The temperature dependence of $\Delta R/R_o$ is illustrated in Fig. 4. Numerical data on the temperature and field dependence of $\Delta R/R_o$ for different iodine concentrations are given in tables. It was found that the resistivity of liquid selenium decreases very much in strong electric fields (maximum: 12-14%). The field effect decreases with increasing temperature under otherwise equal conditions. The critical field is $\simeq 10^3 \ldots 10^4$ v/cm. In undercooled selenium, the field effect increases monotonically with decreasing temperature. The temperature dependence is distinctly marked within this range. These results indicate that liquid selenium has an n-type and not a p-type conductivity. The maximum of the relative change in resistivity observed with a 0.3% iodine addition is related to the concentration dependence of the structure of the impurity complexes. Yu. V. Ilisavskiy and S. G. Shul'man are thanked for discussions. A. F. Ioffe and M. K. Shidlovskiy are mentioned. There are 5 figures, 1 table, and 16 references: 14 Soviet, 1 US, and 1 Japanese.

Card 2/6

86432

S/181/60/002/011/016/042
B006/B056

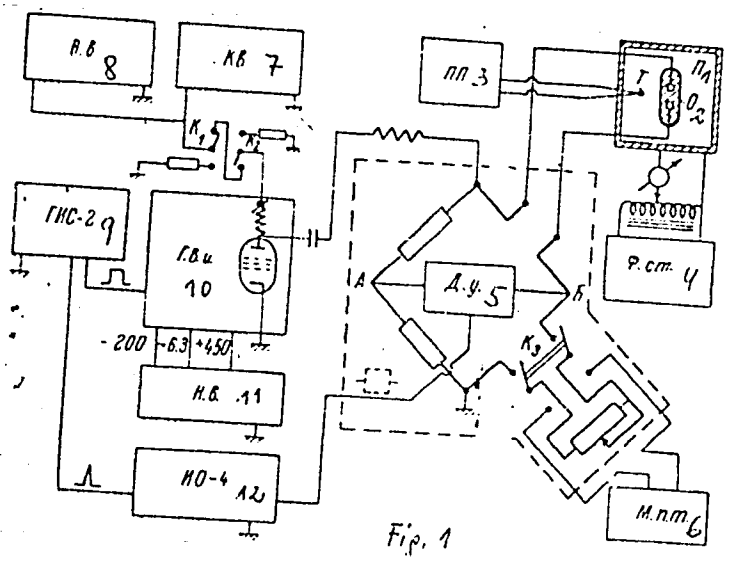


Fig. 1

Card 4/6

86432

Se + 0.3% J

T \ E	0.13	0.27	0.53	0.8	1.0
200	0.7	2.75	6.5	10.4	14.4
250	0.5	2.1	5.5	8.6	12.0
300	0.25	1.4	4.0	6.8	9.8
325	0.1	1.0	3.2	6.0	8.4

Se + 0.5% J

T \ E	0.27	0.53	0.8	1.0
250	0.5	2.7	5.1	7.4
300	0.3	2.2	4.3	6.6
350	0.1	1.6	3.5	5.7

Se + 1.0% J

T \ E	0.27	0.53	0.8
200	0.5	2.2	4.6
250	0.4	2.1	4.4
300	0.4	2.0	4.2
350	0.3	1.9	4.0

Card 6/6

30074
S/048/61/025/011/020/031
B117/B102

15 2660

AUTHORS: Smolenskiy, G. A., and Andreyev, A. A.

TITLE: A study of ferrimagnetics with magnetoplumbite and garnet structure in strong pulsed magnetic fields

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya. v. 25, no. 11, 1961, 1392-1395

TEXT: The authors determined the saturation magnetization and the spin configuration at room temperature and at liquid-nitrogen temperature of a large group of rare-earth hexoferrites which were synthesized in the authors' laboratory in the Institut poluprovodnikov Akademii nauk SSSR (Institute of Semiconductors of the Academy of Sciences USSR). They also examined the non-collinear orientation of spins in rare-earth garnets. Pulsed magnetic fields (up to 150 kOe) were produced by discharge of a capacitor battery over a solenoid. The pulse duration was $3 \cdot 10^{-3}$ sec. In a 0.5 cm^3 volume, the field inhomogeneity did not exceed a few percents. Two balanced coils were connected in series, and the sample, spherical or cylindrical, of a volume of up to 50 mm^3 was inserted into

Card 1/4

30074
S/048/61/025/011/020/031
B117/B102

one of them. An oscilloscope indicated the signals. The maximum error of measurement was 7%. To maintain the required electric neutrality, a trivalent rare-earth ion (or Bi^{3+} ion) to replace Ba^{2+}, and a bivalent Ni^{2+}, Mg^{2+}, Co^{2+} ion or others to replace Fe^{3+}, were introduced simultaneously. A large group of solid solutions on barium hexaferrite base, including new compounds of the type $M^{3+}Fe^{3+}_{12}M^{2+}O_{19}$ with magnetoplumbite structure, were obtained in this way. The solid solutions $(1-x)\,Ba^{2+}Fe^{3+}_{12}O_{19} - xM^{3+}Fe^{3+}_{11}M^{2+}O_{19}$ were examined. $M^{3+} = La^{3+}$, Pr^{3+}, or Bi^{3+}; $M^{2+} = Co^{2+}$ or Ni^{2+}. Synthesis took place by solid phase reaction. Pre-annealing was carried out at 1100°C, and final annealing at 1250°C. For compositions with bismuth oxide, these temperatures were reduced as far as 800°C and 970°-1100°C, respectively. P. G. Tutov performed the X-ray structural analysis. Magnetization measurements showed that saturation magnetization drops with a rise of the content of the second component. The differential susceptibility determined by the hysteresis loop was low in strong fields. This points to a collinear orientation of the magnetic moments. When the second component is introduced, the

30074
S/048/61/025/011/020/031
B117/B102

A study of ferrimagnetics

It is therefore little probable that its magnitude could depend upon the para process of the relatively weakly bound magnetic sublattice of rare earth ions. The umklapp process of magnetic moments expected due to a relatively weak exchange coupling of the sublattice could not be established, in the case of Ho garnet, in fields of up to 150 koe neither at room temperature nor at 77°K. Ye. S. Sher is thanked for having provided the samples, and A. G. Tutov for having studied them. There are 2 figures and 3 non-Soviet references. The two references to English-language publications read as follows: Ref. 2: Geller S., Williams H. J., Sherwood R. C., Amer. Ceram. Soc., 43, 1 (1960); Ref. 3: Pauthenet R., Compt. rend. Acad. Sci., 250, 2403 (1960).

ASSOCIATION: Institut poluprovodnikov Akademii nauk SSSR (Institute of Semiconductors of the Academy of Sciences USSR)

Card 4/4

MISHCHENKO, N.M.; BELEVTSOV, G.A.; ROTMISTROVSKIY, B.M.; IVANENKO, A.Ya.; KONOVALOV, S.I.; MYTSENKO, D.I.; ANDREYEV, A.A.; GAYDUKOV, V.S.

Complex automation of blast furnace air preheaters. Stal' 23 no.6:497-499 Je '63. (MIRA 16:10)

1. Yenakiyevskiy metallurgicheskiy zavod.

L 1346-66 EWT(l)/EWP(e)/EWT(m)/EWP(i)/T/EWP(b)/EWA(h) IJP(c) AT/WH

ACCESSION NR: AP5022135 UR/0030/65/000/008/0070/0072

AUTHOR: Andreyev, A.A.; Regel', A.R. (Doctor of physico-mathematical sciences)

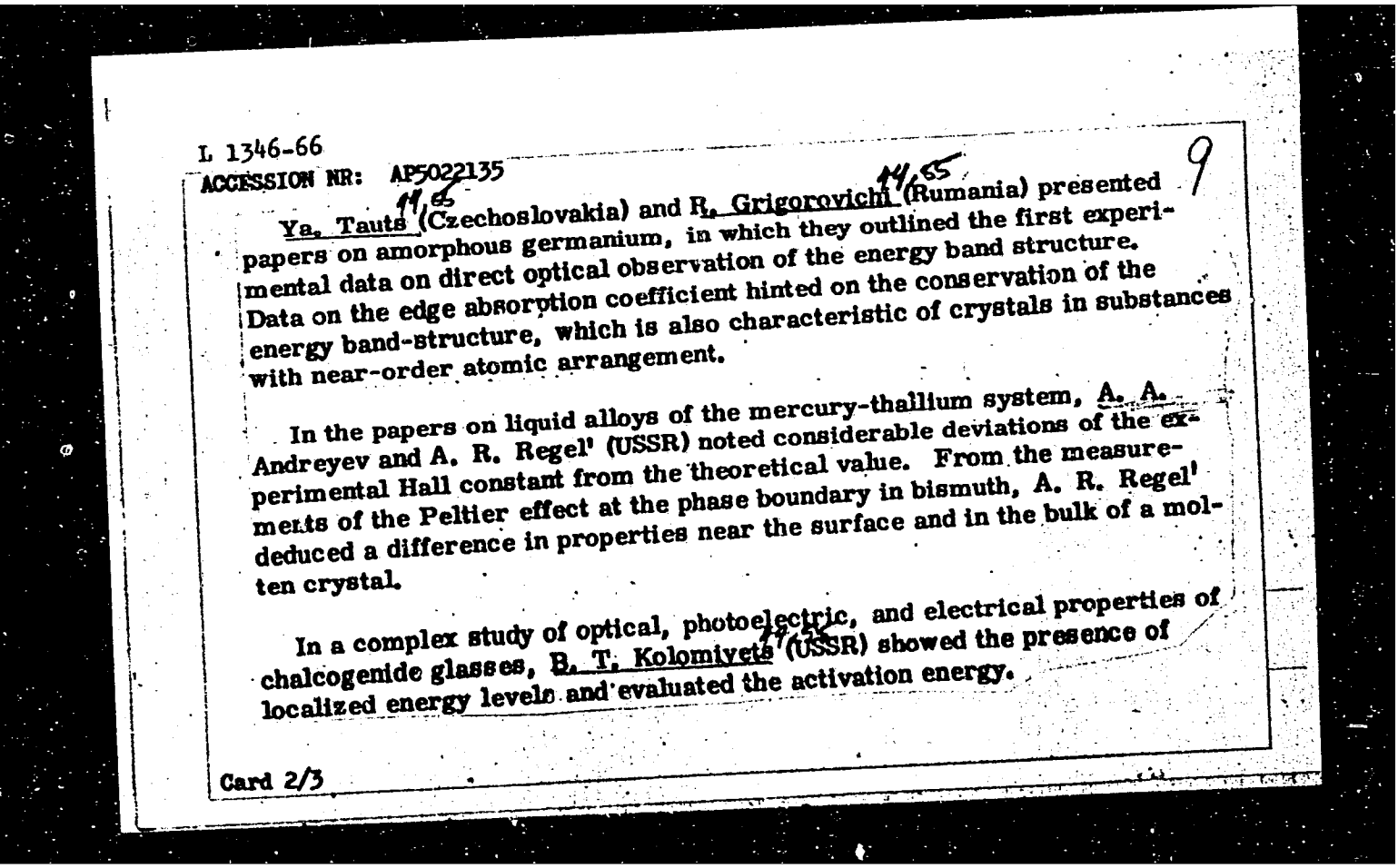
TITLE: Conference on band structure, optical, and electrical properties of liquid and amorphous semiconductors

SOURCE: AN SSSR. Vestnik, no. 8, 1965, 70-72

TOPIC TAGS: electronic conference, semiconductor band structure, semiconductivity, semiconducting material, semiconductor research, glass, tellurium, selenium, semiconductor alloy

ABSTRACT: A Conference on the Electronic Band Structure, Optical and Electrical Properties of Semiconductor Liquids and Amorphous Solids was held on 4-7 May in Prague, under the sponsorship of the Institute of Solid State Physics, Czechoslovak Academy of Sciences. Research data were discussed on electronic processes in amorphous germanium, selenium, and tellurium, liquid semiconductors and metals, and chalcogenide glasses. Both Western and Soviet-bloc scientists participated in discussions.

Card 1/3



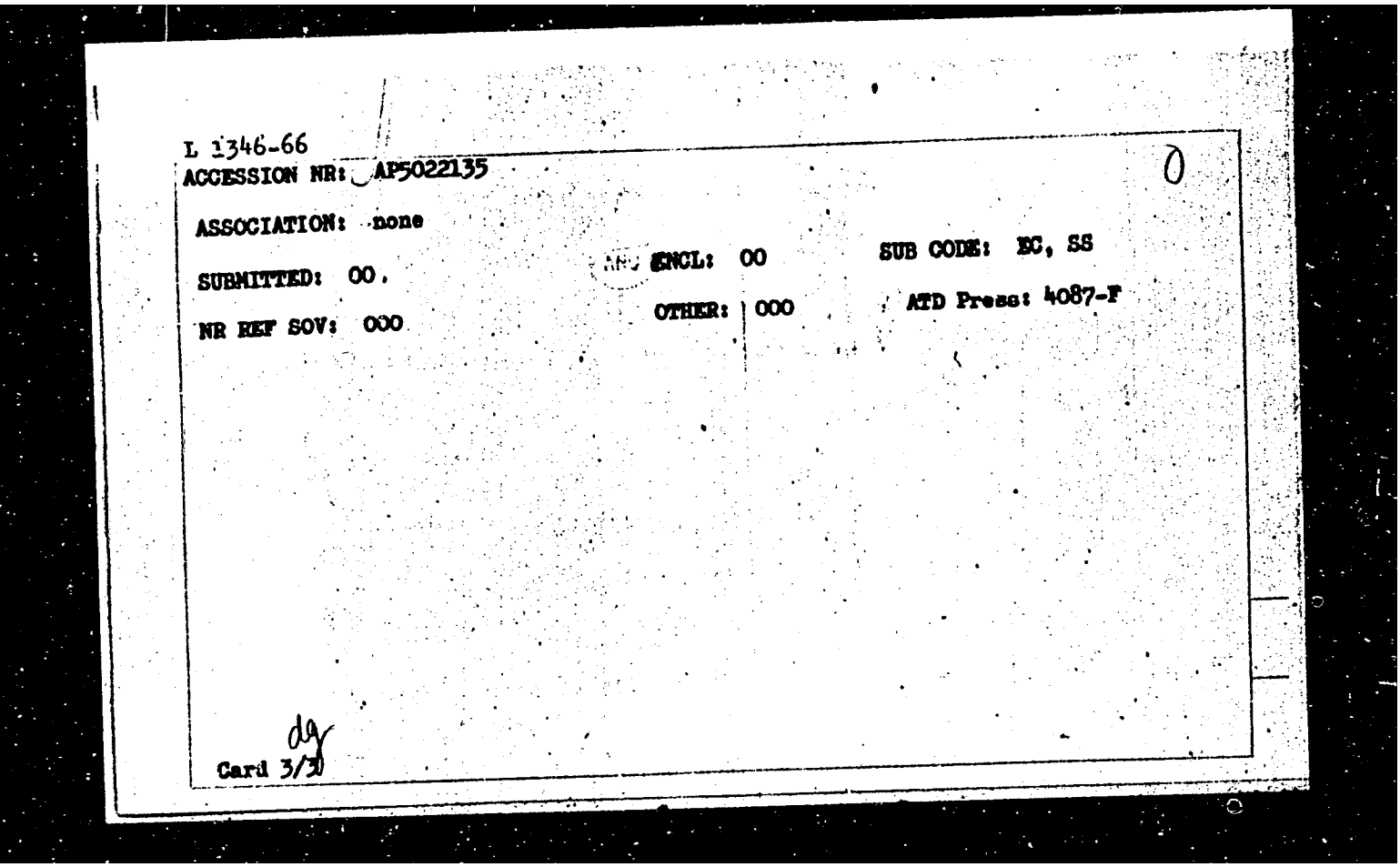
L 1346-66
ACCESSION NR: AP5022135

Ya. Tauts (Czechoslovakia) and R. Grigorovichi (Rumania) presented papers on amorphous germanium, in which they outlined the first experimental data on direct optical observation of the energy band structure. Data on the edge absorption coefficient hinted on the conservation of the energy band-structure, which is also characteristic of crystals in substances with near-order atomic arrangement.

In the papers on liquid alloys of the mercury-thallium system, A. A. Andreyev and A. R. Regel' (USSR) noted considerable deviations of the experimental Hall constant from the theoretical value. From the measurements of the Peltier effect at the phase boundary in bismuth, A. R. Regel' deduced a difference in properties near the surface and in the bulk of a molten crystal.

In a complex study of optical, photoelectric, and electrical properties of chalcogenide glasses, B. T. Kolomiyets (USSR) showed the presence of localized energy levels and evaluated the activation energy.

Card 2/3



L 1346-66
ACCESSION NR: AP5022135

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

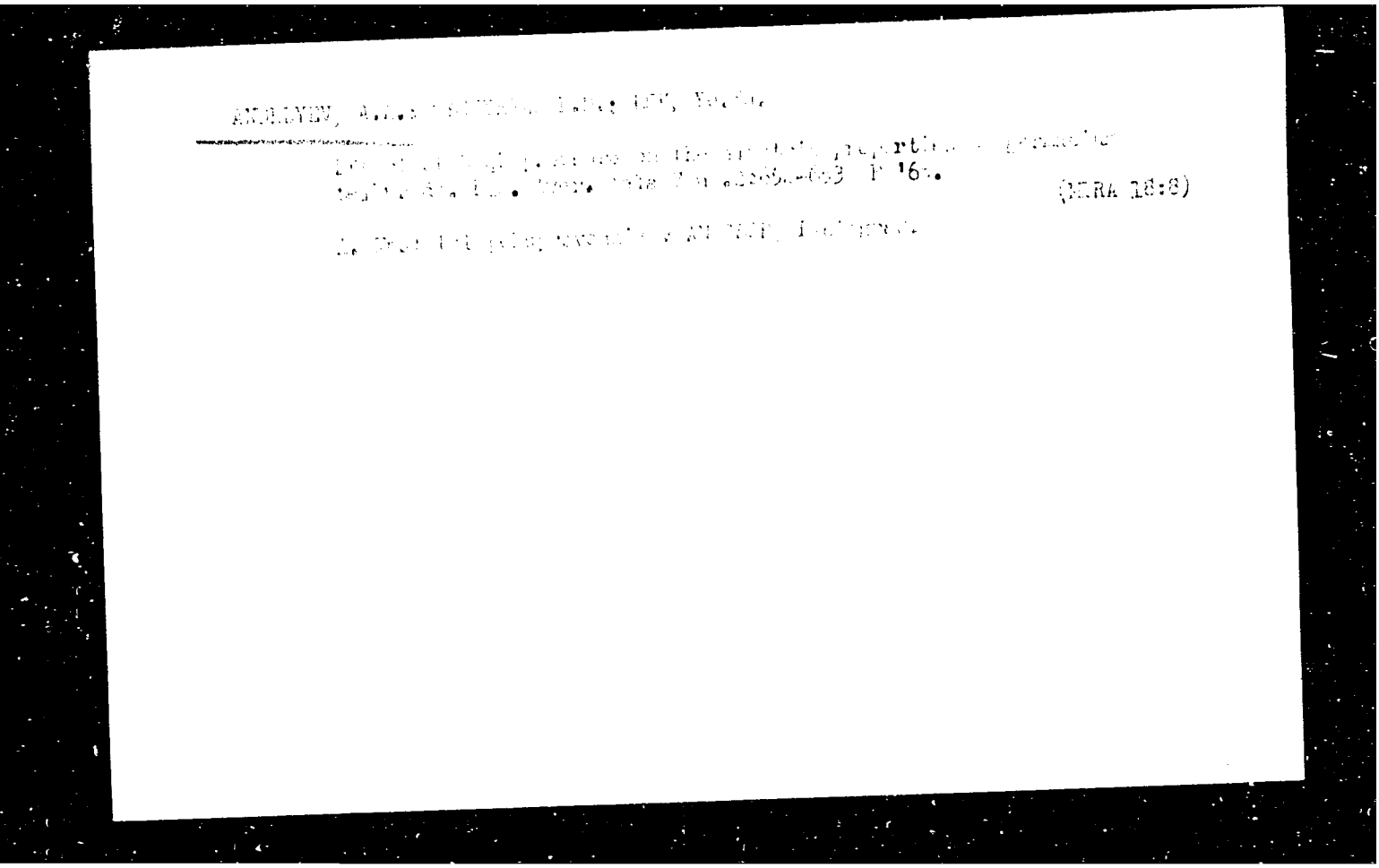
SUB CODE: EC, SS

NR REF SOV: 000

OTHER: 000

ATD Press: 4087-F

Card 3/3



L 8164-66 EWT(1)/EWT(m)/ETC/EWG(m)/EWP(b)/EWP(t) IJP(c) RDW/JD

ACCESSION NR: AP5019892 UR/0181/65/007/008/2558/2559

AUTHOR: Andreyev, A. A.; Sysoyeva, L. M.; Lev, Ye. Ya.

TITLE: Temperature dependence of the Hall effect and electric conductivity in germanium telluride

SOURCE: Fizika tverdogo tela, v. 7, no. 8, 1965, 2558-2559

TOPIC TAGS: germanium compound, telluride, electric conductivity, Hall effect, thermal emf, semiconductor carrier

ABSTRACT: To explain some anomalies observed in the behavior of the electric conductivity and thermal emf of germanium telluride, the authors measured the Hall coefficient in the interval from room temperature to 500C for three samples of GeTe with different carrier densities (2.5, 6, and 11 x 10^{20} cm^{-3}). The samples with 11 x 10^{20} cm^{-3} was a single crystal. The measurements were made with alternating current and the measurement accuracy was ~3%. The results are shown in Figure 1 of the Enclosure. The sharp decrease in the Hall constant in the 300 — 400C region correlates with the phase transition in GeTe. Measurements of the temperature dependence of the electric conductivity increases upon melting and that the liquid has a positive temperature coefficient. This can be interpreted as a result of

Card 1/3

L 8164-66

ACCESSION NR: AP5019892

retention of the semiconductor properties in the liquid state. The change in the slope of the electric conductivity vs. temperature curve in the interval 350 — 400C is interpreted as due to the appearance of carriers of the opposite sign. Orig. art. has: 2 figures.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors AN SSSR)

SUBMITTED: 05Apr65 ENC: 01 SUB CODE: SS

NR REF SOV: 002 OTHER: 001

Card 2/3

L 8164-66
ACCESSION NR: AP5019892 ENCLOSURE: 01

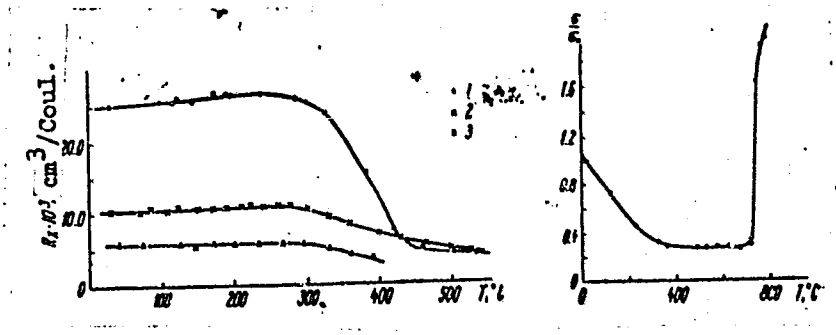


Fig. 1. Temperature dependence of Hall coefficient for samples with different carrier density (left) and for a sample with excess tellurium (right).

jw

Card 3/3

L 8592-66 EWT(m)/EWP(b)/EWP(t) IJP(c) JG/JD

ACCESSION NR: AP5019897 UR/0181/65/007/008/2567/2569

44,55 44,55 31

AUTHOR: Andreyev, A. A.; Regel', A. R. 39

21,44,55 B

TITLE: Hall coefficient in liquid alloys of the Hg-Tl system

SOURCE: Fizika tverdogo tela, v. 7, no. 8, 1965, 2567-2569

TOPIC TAGS: Hall coefficient, mercury alloy, thallium containing alloy, liquid property, chemical valence 27 27

ABSTRACT: To reconcile the disparity between the experimental data on the Hall effect in liquid metals and the prediction of the theory of free electrons, the authors performed on the Hg-Tl system the experiments made on Hg-In by N. Cussack and P. W. Kendall (Phil. Mag. v. 8, 157, 1963). The measurements were made with alternating current in the same ampoule, to avoid errors due to the size effect. The calculations were made relative to pure mercury, for which the Hall constant was taken to be $R = 7.6 \times 10^{-5}$ cm^3/Coul. The results are illustrated in Fig. 1 of the Enclosure and confirm the quasi-crystalline model used by Cussack and Kendall to interpret their results. However, the authors indicate also another possible interpretation of the phenomena, wherein the results can be attributed to variation of the valence of the heavy-element atoms. Confirmation of this interpretation calls for additional experiments. Orig. art. has: 2 figures.

Card 1/3 2

L 8592-66
ACCESSION NR: AP5019897

44155 3

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors AN SSSR)

SUBMITTED: 09Apr65 ENCL: 01 SUB CODE: SS, MM

NR REF SOV: 000 OTHER: 002

Card 2/3

L 8592-66

ACCESSION NR: AP5019897

ENCLOSURE: 01

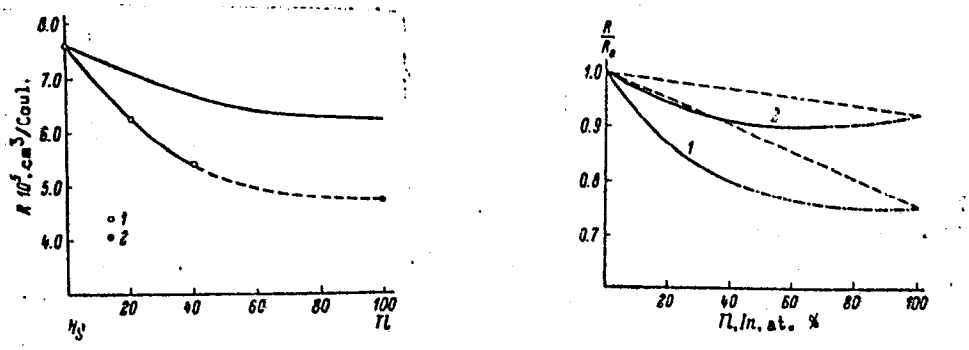


Fig. 1. Hall coefficient in the Hg-Tl system (left) as a function of the Tl concentration, and comparison of the effects of Tl and In on the Hall coefficient of the mercury compound (right).

jw

Card 3/3

PA 50T42

USSR/Geophysical Prospecting Jan 1947
Magnetic Fields

"Calculations of the Spatial Distribution of Potential Fields and Their Application to Prospecting Geophysics," B. A. Andreyev, 14 pp

"Izv Akad Nauk SSSR, Ser Geograf i Geofiz" Vol XI, No 1

Discusses methods of calculating the spatial distribution of potential fields in connection with various problems of geophysical prospecting. Recommends the formula that solves Dirichlet's problem for infinite plane. Theoretical considerations and practical examples of calculation show that

[redacted] 50T42

USSR/Geophysical Prospecting (Contd) Jan 1947

application of formula sufficiently easy, and gives great accuracy in results. Shows that possible to use method to analyze results obtained in aeromagnetic surveys, and to reduce results of geophysical observations to one plane. Submitted by Academician L. S. Leybenzon.

[redacted] 50T42

ANDREYEV, A.B.

ACCESSION NR: AT4037659 S/2981/64/000/003/0182/0193

AUTHOR: Fridlyander, I. N.; Andreyev, A. D.; Pavlova, I. K.; Romanova, O. A.; Archakova, Z. N.

TITLE: Selection of a fabrication process and a study of the effects of technological factors on the structure and properties of alloy VAD23

SOURCE: Alyuminiyevy*ye splavy*, no. 3, 1964. Deformiruyemy*ye splavy* (Malleable alloys), 182-193

TOPIC TAGS: aluminum alloy, alloy VAD23, alloy structure, alloy mechanical property, alloy hardening, alloy aging, alloy casting, alloy hot pressing, alloy hot rolling, alloy cold rolling, alloy forging, alloy semiproduct anisotropy, high strength aluminum alloy, heat resistant aluminum alloy

ABSTRACT: Ingots (diameter 300 mm. length 1000 mm) of alloy VAD23 were factory dip-cast (flux refined, kept 60 min. at 745-780C, poured, 1.4% Li and 0.15% Cd added in mold, liquid flux 46% LiCl plus 54% KCl, mixed, settled at 750-770C, dip rate 15-18 mm/min), then homogenized for 24 hrs. at 510 ± 10C. The ingots were then hot pressed into PR306-7 sections (deformation 94%, 420-440C; hardened 60 min. at 525 ± 5C, aged 12 hrs. at 170C), panels (wall thickness 4-15 mm;

Card 1/3

ACCESSION NR: AT4037659

pressed at 420C from forgings 550 x 150 x 600 mm; 525 ± 5C, then aged 16 hours at 170C), 0.8 - 8.0 mm thick sheets (hot rolled at 370-390C to 8 or 4 mm, then cold rolled after annealing to 40-60% reductions; hardened as above) and forgings measuring 90 or 120 x 200 x 400 mm (forged after 24 hrs. at 400-450C, hardened 4 hrs. at 525 ± 5C, aged 16 hours at 170C). Results of mechanical tests are tabulated for all intermediate products and show that pressing or rolling temperatures exert no significant effects on mechanical properties of rods and sheets in the respective ranges of 380-480 and 290-400C. Drawing did not affect tensile strength or yield of hot pressed rods, but relative elongation increased. Tensile strength of sheets increased somewhat with deformation in cold rolling (56 kg/mm^2 at 12% to 58 at 32%), relative elongation increased from 0.5% at 12% to 5.6% at 51%. The optimal hardening temperature was found to be 525C, and the best aging procedure was 12-16 hours at 170C. Precooling during hardening reduces tensile strength sharply when exceeding 30 sec., while relative elongation increased at first. The crosswise-lengthwise tensile strength variation ranged from 1-3 kg/mm^2 for twice pressed samples to 10-13 kg/mm^2 for once pressed rods, and is related to a more or less pronounced pressing effect. "K. N. Fomin, V. I. Potapova and Ye. N. Kalinina also took part in the work." Orig. art. has: 13 figures and 5 tables.

Card 2/3

ANDREYEV, A.D.; ZASYPKIN, V.A.; ISTRIN, M.A.

Conference on efficient furnace designs for melting aluminum alloys.
TSvet. met. 38 no.4:73-80 Ap '65. (MIRA 18:5)

L 36380-66 EWP(k)/EWT(m)/EWT(t)/ETI IJP(c) JD

ACC NR: AP6009864 SOURCE CODE: UR/0413/66/000/004/0058/0058

INVENTOR: Reykhert, K. N.; Andreyev, A. D.; Gurov, P. G.

ORG: none

TITLE: Device for ingot cooling with an air-water mixture in continuous casting of aluminum alloys. Class 31, No. 175750

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 4, 1966, 58

TOPIC TAGS: ~~casting~~, ingot cooling, ~~aluminum~~ metal casting, metalworking machinery

ABSTRACT: An Author Certificate has been issued describing a device for cooling ingots with an air-water mixture; the device consists of two chambers for air and water. To improve the quality of castings, the device is equipped with rings, which are screwed on the bottom of the crystallizer, and adjustable slots for supplying and mixing water and air as well as a slot for feeding the air-water mixture onto the ingot (See Fig. 1). [LD]

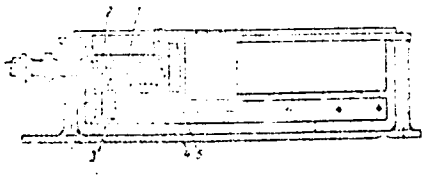
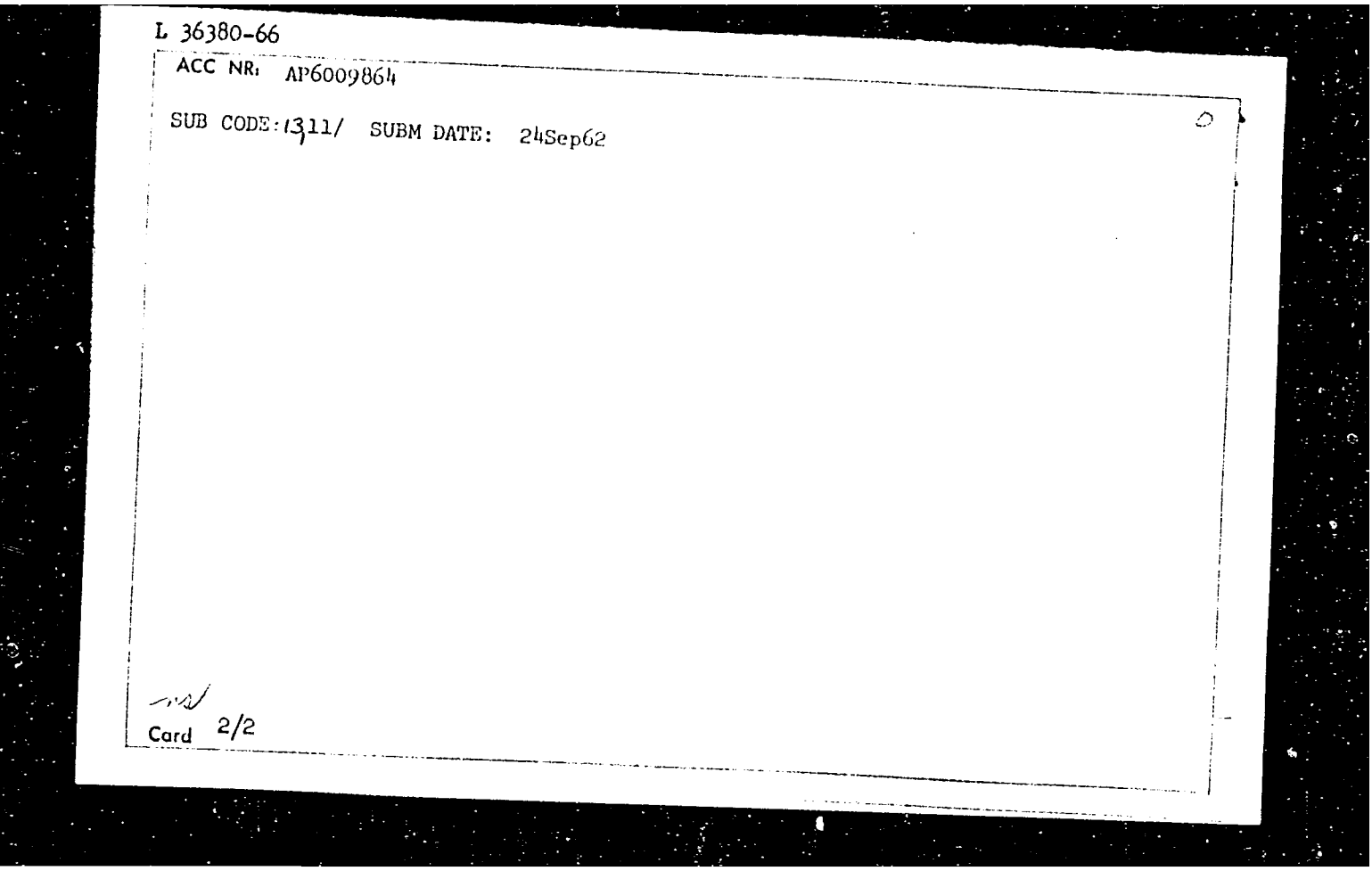


Fig. 1. Device for cooling ingots during continuous casting of aluminum alloys

1 - crystallizer chassis; 2 and 3 - rings; 4 - slots for feeding and mixing water and air; 5 - slot for feeding the air-water mixture.

Card 1/2 UDC: 621.746.27—717



L 36380-66

ACC NR: AP6009864

SUB CODE: 13/11/ SUBM DATE: 24Sep62

Card 2/2

L 11418-67 EWT(1) IJP(c)

ACC NR: AP6031266 SOURCE CODE: UR/0057/66/036/009/1636/1638

AUTHOR: Andreyev,A.D.; Il'in,V.D.; Lobanov,Yu.N.

ORG: none

TITLE: High frequency discharge within a ring electrode

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 9, 1966, 1636-1638

TOPIC TAGS: discharge plasma, rf plasma, nitrogen, plasma density, plasma radiation, plasma electron temperature

ABSTRACT: The authors have investigated the excitation of nitrogen plasmas within a cylindrical chamber by a high-frequency voltage applied to a cylindrical electrode outside of and coaxial with the chamber. The cylindrical chamber was approximately 78 mm in diameter and 19 mm in altitude. /Abstractor's note: these figures are not given in the paper; they were obtained by scaling a drawing./ The plasmas were excited by applying 2 to 6 kV to 2 MHz from an impact excited oscillator to the external cylindrical electrode. The plasmas were photographed through the end wall of the chamber; the radiation emitted by the plasmas was detected with a photomultiplier and its pulsation was observed with an oscilloscope; and the electron density and temperature of the plasmas were measured with the aid of a probe in the center of the chamber. At high nitrogen pressures (1 torr) the visible discharge within the chamber was confined to a thin layer next to the wall. When the pressure was reduced, the discharge broke away from the wall and extended toward the center of the chamber. As the pressure was

Card 1/2 UDC: 537.525.72

L 11418-67
ACC NR: AP6031266

decreased from 0.06 to 0.02 torr the radius of the region of greatest luminosity decreased from 38 to 24 mm. At low pressures, when the radiation came from regions of the chamber far from the walls, the radiation intensity pulsated at the 2 MHz excitation frequency; at high pressures, when the radiation came only from the immediate vicinity of the wall, it pulsated at twice the excitation frequency. The electron concentration decreased from 4×10^{11} to 2.6×10^{10} cm^{-3} as the gas pressure was reduced from 0.9 to 0.05 torr. The electron temperature remained practically independent of the exciting voltage at about 5 eV. Orig. art. has: 5 figures.

SUB CODE: 20 SUBM DATE: 30Oct64 ORIG. REF: 001

Card 2/2 bab

L 01247-67 EWT(1)
ACC NR: AP6030709 SOURCE CODE: UR/0368/66/005/002/0145/0147

AUTHOR: Andreyev, A. D.

ORG: none

48

TITLE: Origination of luminescence pulsation of a high-frequency ring discharge

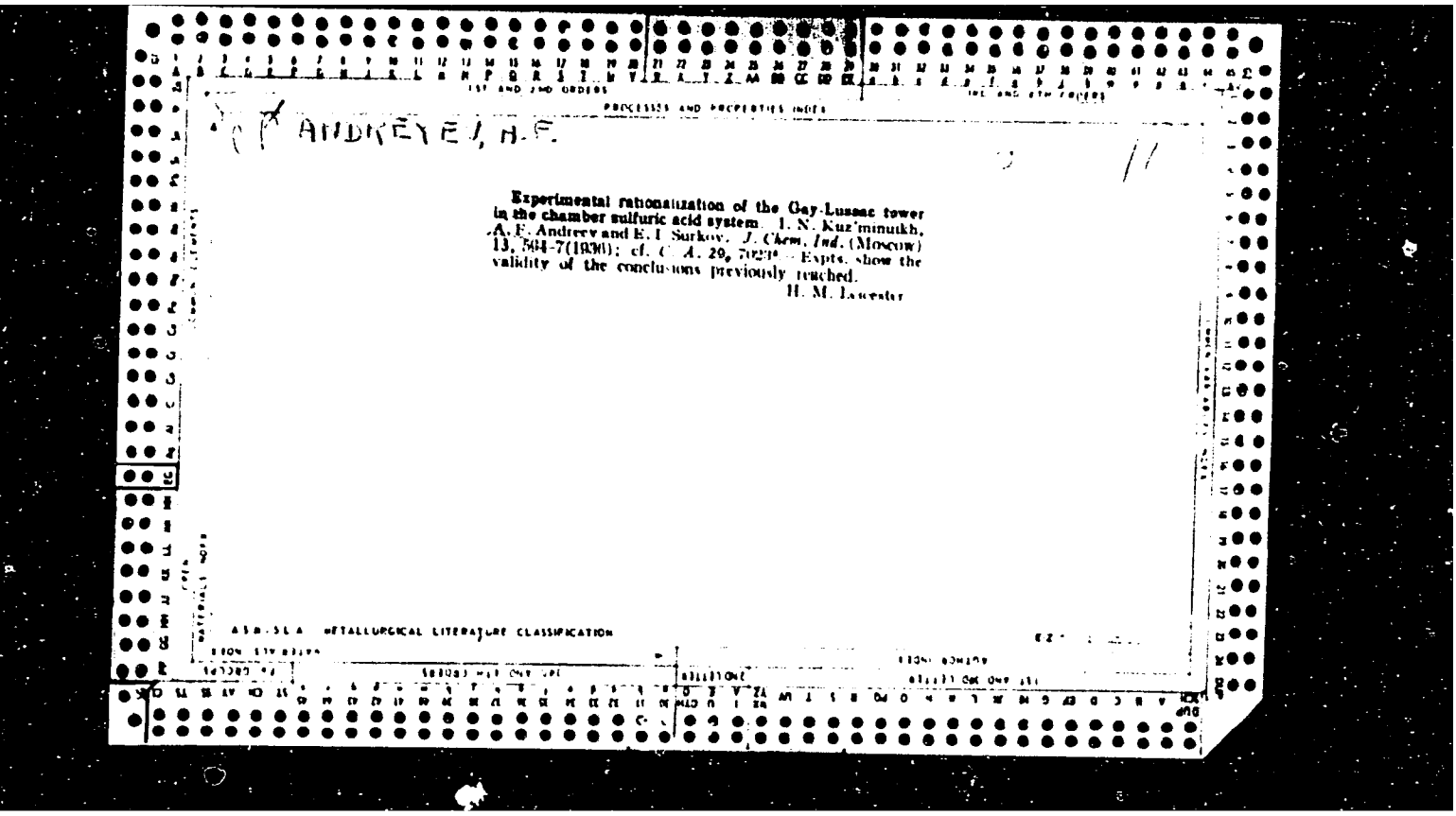
SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 2, 1966, 145-147

TOPIC TAGS: luminescence, glow discharge, pulsation, high frequency discharge, electric field

ABSTRACT: The results of investigations are described concerning luminescence of an electrodeless high-frequency (2Mc) ring discharge in the air (0.02--10 mm Hg). The glow discharge has pulsations. The pulsation value is different within the limits of a time interval equal to the period of the external field. The qualitative effect of the constant internal electric field on the pulsation value is discussed. Orig. art. has: 2 figures. [Based on author's abstract] [NT]

SUB CODE: 03/ SUBM DATE: 15Mar65/ ORIG REF: 004/

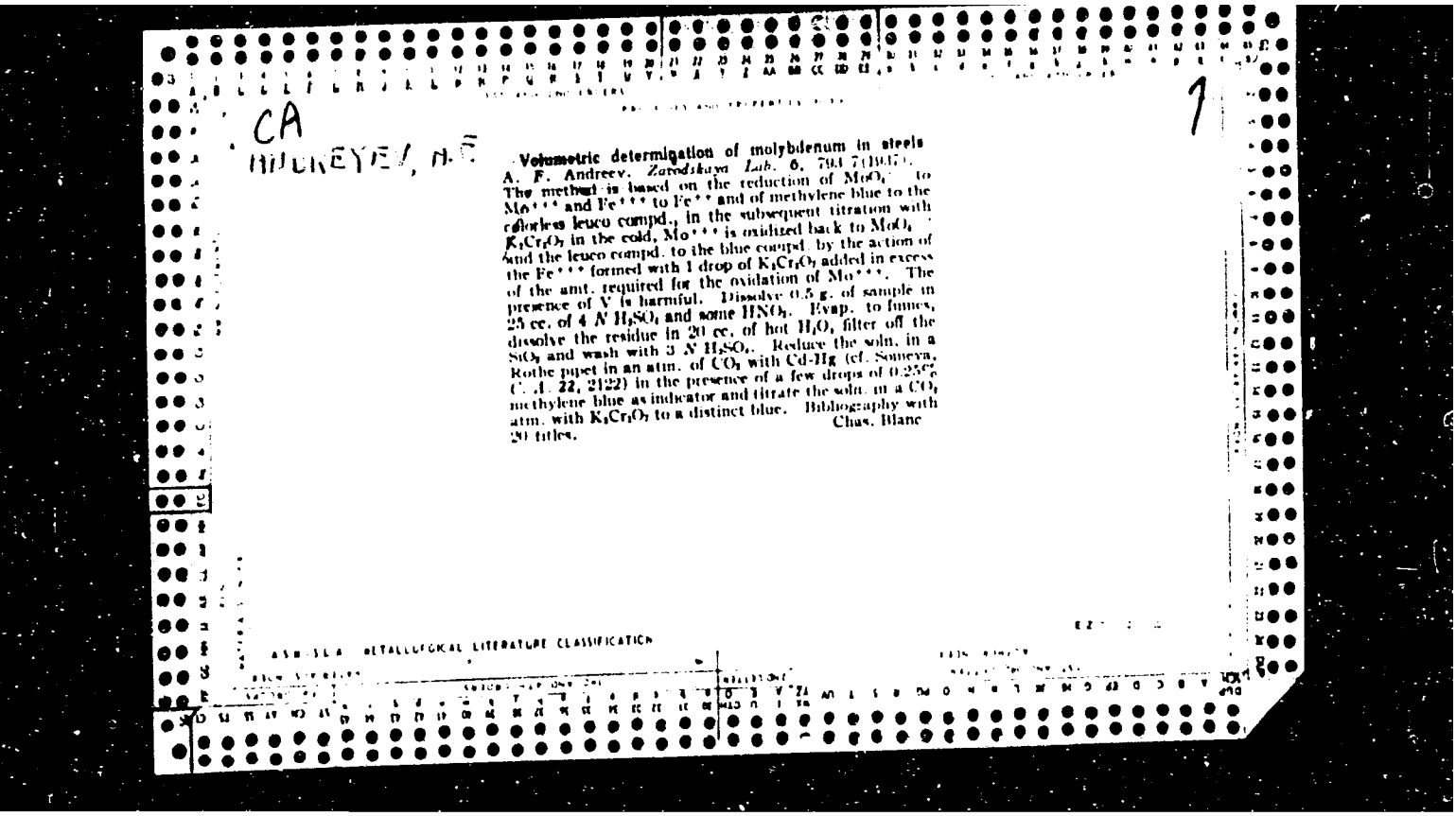
Card 1/1 hs UDC: 537.535.1



ANDREYEV, A.F.

Experimental rationalization of the Gay-Lussac tower in the chamber sulfuric acid system. I. N. Kuz'minukh, A. F. Andreev and E. I. Surkov. *J. Chem. Ind.* (Moscow) 13, 584-7(1936); cf. C. A. 29, 7023[9]. Expts. show the validity of the conclusions previously reached.

H. M. Lancaster



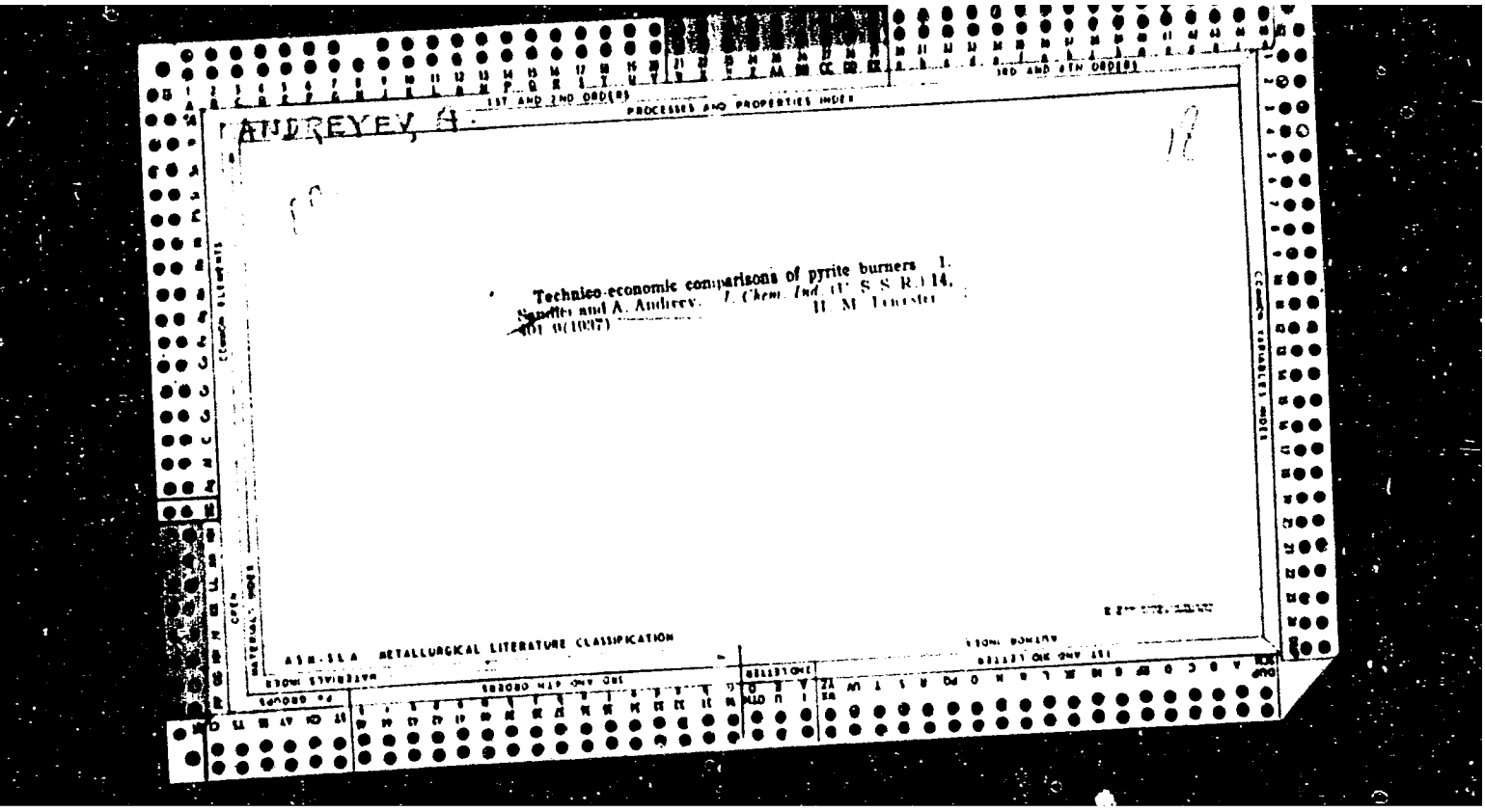
CA

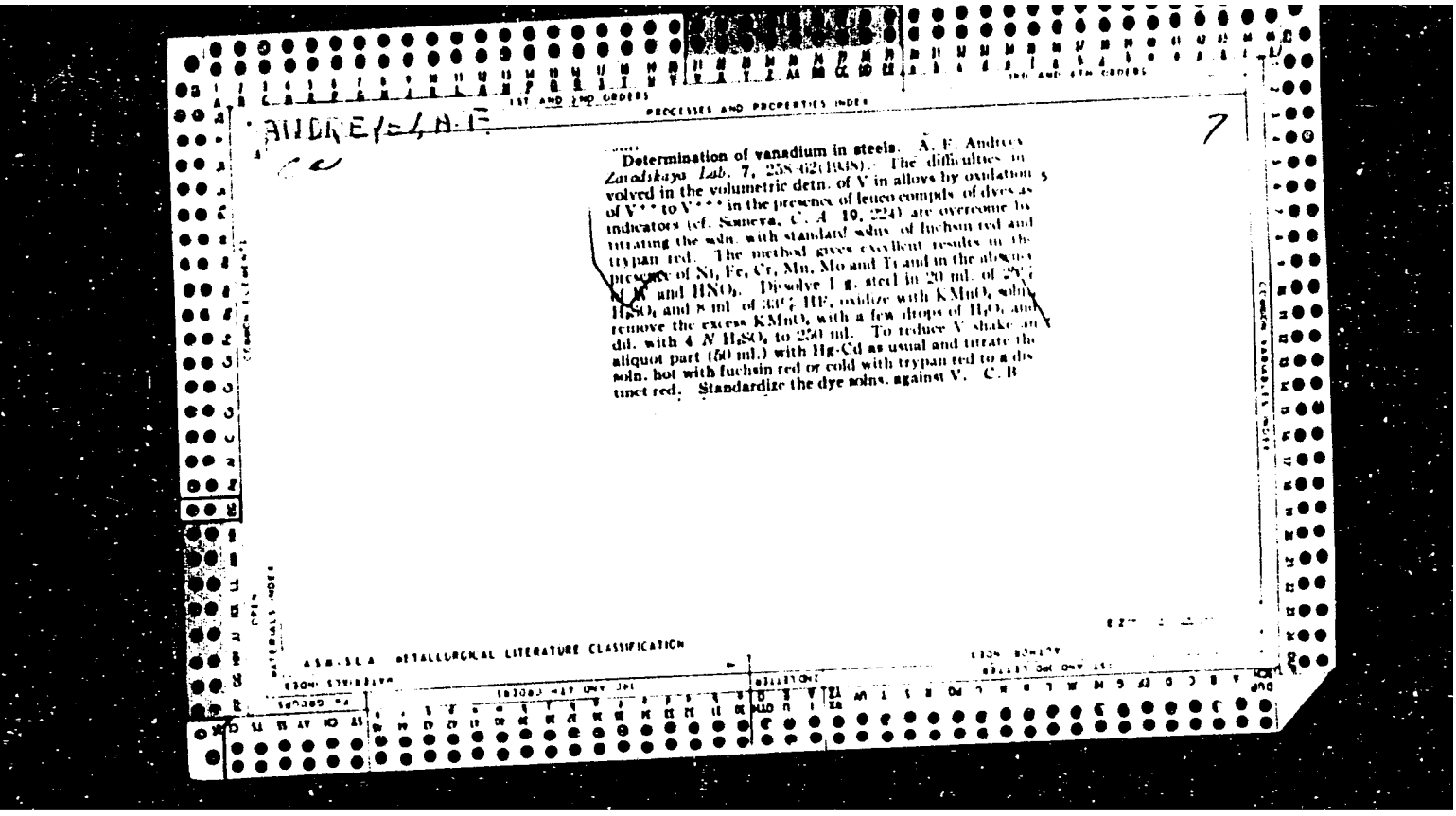
1

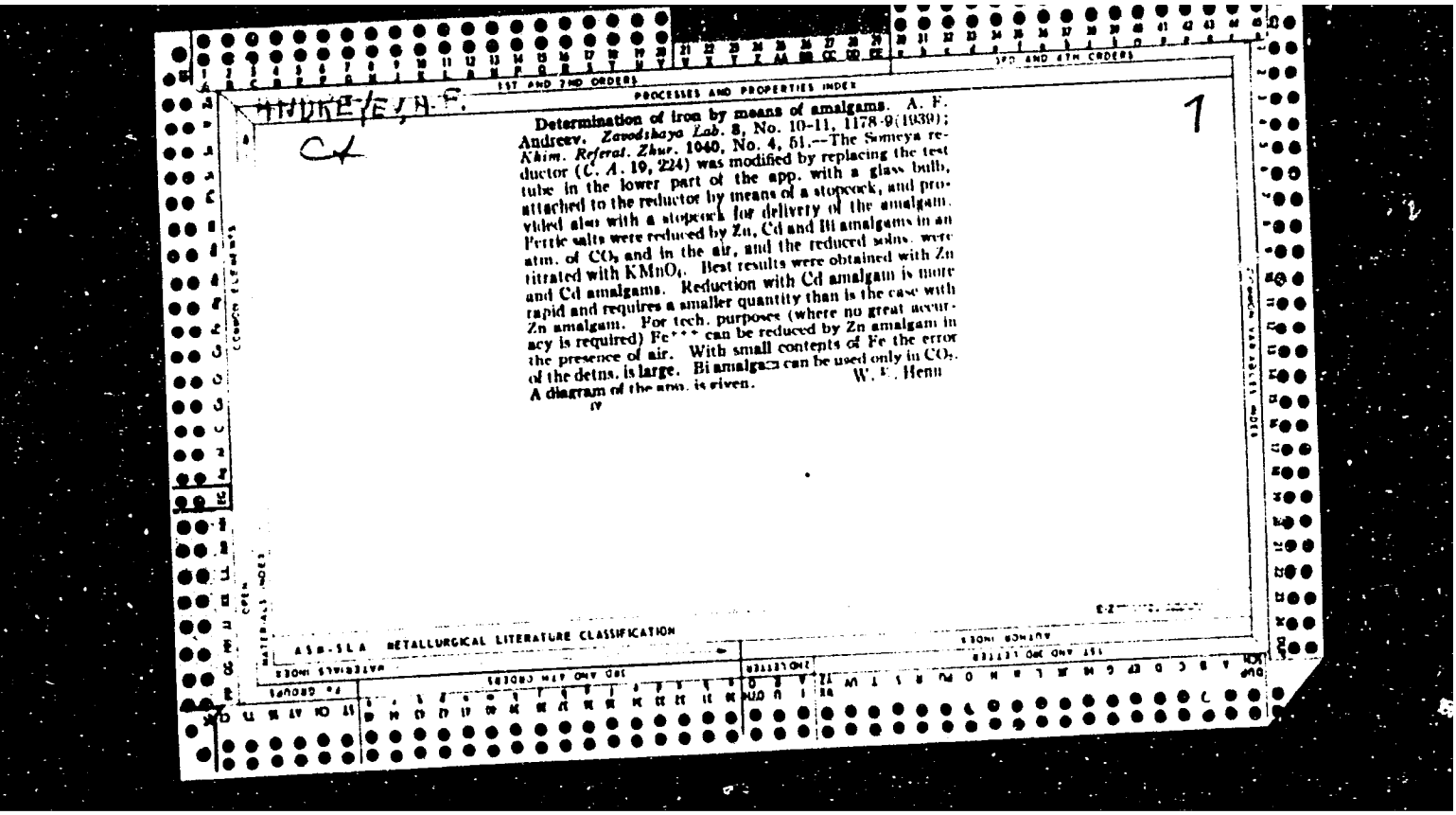
Volumetric determination of molybdenum in steels. A. F. Andreev. *Zavodskaya Lab.* 6, 793-7(1937). The method is based on the reduction of MoO_4^{--} to Mo^{+++} and Fe^{+++} to Fe^{++} and of methylene blue to the colorless leuco compd., in the subsequent titration with $K_2Cr_2O_7$ in the cold, Mo^{+++} is oxidized back to MoO_4^{--} and the leuco compd. to the blue compd. by the action of the Fe^{+++} formed with 1 drop of $K_2Cr_2O_7$ added in excess of the amt. required for the oxidation of Mo^{+++}. The presence of V is harmful. Dissolve 0.5 g. of sample in 25 cc. of 4 *N* H_2SO_4 and some HNO_3. Evap. to fumes, dissolve the residue in 20 cc. of hot H_2O, filter off the SiO_2 and wash with 3 *N* H_2SO_4. Reduce the soln. in a Rothe pipet in an atm. of CO_2 with Cd-Hg (cf. Someya, C. A. **22**, 2122) in the presence of a few drops of 0.25% methylene blue as indicator and titrate the soln. in a CO_2 atm. with $K_2Cr_2O_7$ to a distinct blue. Bibliography with 20 titles.

Chas. Blanc

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



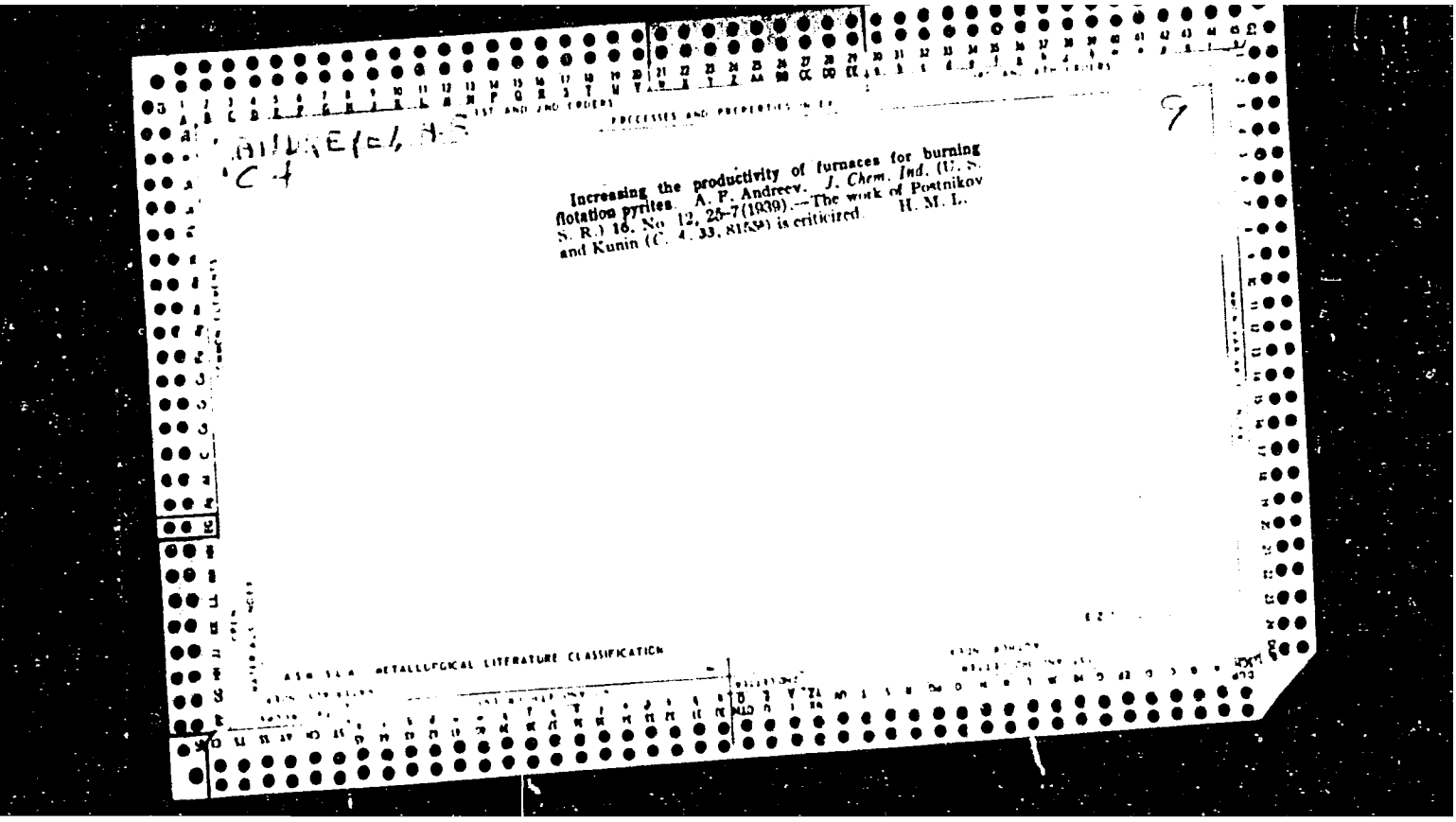




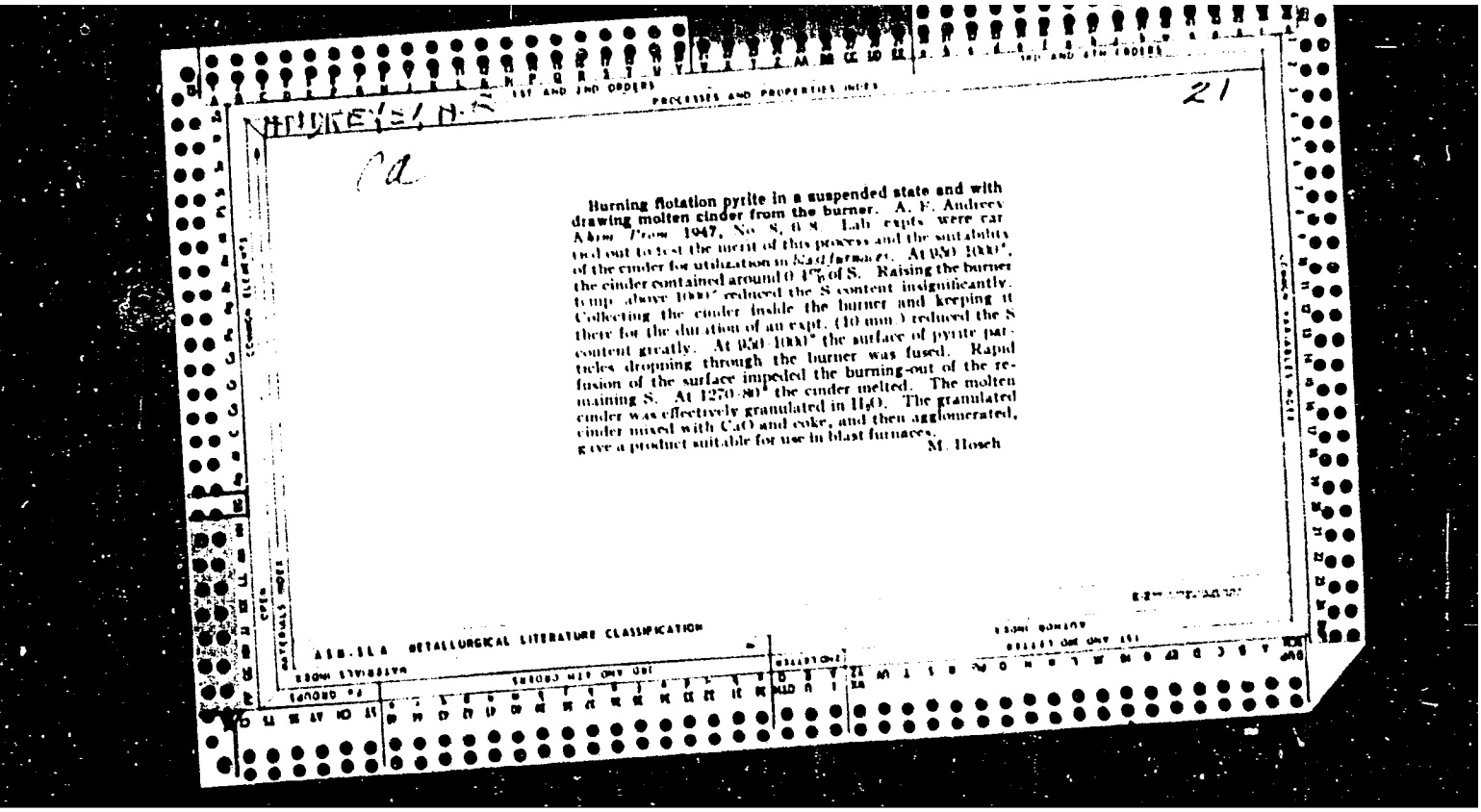
PROCESSES AND PROPERTIES INDEX

1

Determination of iron by means of amalgams. A. F. Andreev. *Zavodskaya Lab.* 8, No. 10-11, 1178-9(1939); *Khim. Referat. Zhur.* 1940, No. 4, 51.—The Someya reductor (*C. A.* 19, 224) was modified by replacing the test tube in the lower part of the app. with a glass bulb, attached to the reductor by means of a stopcock, and provided also with a stopcock for delivery of the amalgam. Ferric salts were reduced by Zn, Cd and Bi amalgams in an atm. of CO_2 and in the air, and the reduced solns. were titrated with $KMnO_4$. Best results were obtained with Zn and Cd amalgams. Reduction with Cd amalgam is more rapid and requires a smaller quantity than is the case with Zn amalgam. For tech. purposes (where no great accuracy is required) Fe^{+++} can be reduced by Zn amalgam in the presence of air. With small contents of Fe the error of the detns. is large. Bi amalgam can be used only in CO_2. A diagram of the app. is given. W. E. Henn



Increasing the productivity of furnaces for burning flotation pyrites. A. P. Andreev. *J. Chem. Ind.* (U. S. S. R.) 16, No. 12, 25–7 (1939).—The work of Postnikov and Kunin (*C. A.* 33, 8159) is criticized. H. M. L.



Burning flotation pyrite in a suspended state and with drawing molten cinder from the burner. A. F. Andreev *Khim. Prom.* 1947, No. 8, 6-8. Lab. expts. were carried out to test the merit of this process and the suitability of the cinder for utilization in blast furnaces. At 850-1000°, the cinder contained around 0.4% of S. Raising the burner temp. above 1000° reduced the S content insignificantly. Collecting the cinder inside the burner and keeping it there for the duration of an expt. (10 min.) reduced the S content greatly. At 850-1000° the surface of pyrite particles dropping through the burner was fused. Rapid refusion of the surface impeded the burning-out of the remaining S. At 1270-80° the cinder melted. The molten cinder was effectively granulated in H_2O. The granulated cinder mixed with CaO and coke, and then agglomerated, gave a product suitable for use in blast furnaces.

M. Hosch

ANDREYEV, A.F., inzhener

Roasting flotation pyrites in a suspended state and discharging the smelted cinders from the furnace. Khim.prom.no.8:226-228 Ag'47. (MLRA 8:12)

1. Ural'skiy nauchno-issledovatel'skiy institut Ministerstva khimicheskoy promyshlennosti SSSR.
(Pyrites)

FD-2732

USSR/Chemistry - Sulfuric acid

Card 1/1 Pub. 50 - 13/20

Authors : Andreyev, A. F. (deceased), Cand Tech Sci; Kostromitih, L. A.

Title : Automatic control of the feeding of flotation pyrite into furnaces

Periodical : Khim. prom. No 5, 297-298, Jul-Aug 1955

Abstract : Describes an automatic control set-up for regulation of the rate of feeding of pyrite dust into furnaces depending on the concentration of the sulfur dioxide coming out of the furnaces. Three graphs, one figure.

Institution : Ural Scientific Research Chemical Institute

SOV/137-59-1-277

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 34 (USSR)

AUTHORS: Apakhov, I. A., Volgin, B. P., Lyapustina, Ye. M., Andreyev, A. F.

TITLE: High-temperature Roasting of Pyrite Maintained in a Suspended [Fluidized] State (Vysokotemperaturnyy obzhig kolchedana vo vzveshennom sostoyanii)

PERIODICAL: V sb.: Vopr. polucheniya sernist. gaza iz kolchedana i sery. Leningrad, Goskhimizdat, 1957, pp 71-78

ABSTRACT: The process of roasting of a flotation concentrate may be greatly enhanced if the surface area of the concentrate is increased by maintaining it in a suspended [fluidized] state at elevated temperatures ($>1000^{\circ}C$). The material injected into the furnace by blowing is preheated to a temperature approaching the temperature of fusion, a partial sintering of the material observed in the process being attributable to the collision of particles; the final formation of the sinter occurs on the bottom of the furnace. The sinter thus obtained contains only ~ 0.2% S and is well suited for blast-furnace smelting. Pilot-plant tests substantiated the possibility of employing this method of roasting, and, in 1953, an experimental-plant

Card 1/2

High-temperature Roasting of Pyrite Maintained in a Suspended

furnace was designed on the basis of these tests. Pilot-plant experiments on roasting of material in a suspended state yielding a liquid end product, which was subsequently granulated, were conducted in a furnace 5.7 m high and 1.5 m in diameter; the experiments revealed the need for an additional supply of heat: this additional heat could be provided by means of combustion of fuel, preheating of air, or utilization of oxygen-enriched air, the latter alternative being the most advantageous.

A. P.

Card 2/2

25193
S/056/61/040/006/014/031
B111/B201

24.1200

AUTHOR: Andreyev, A. F.

TITLE: Theory of sound absorption in weak solutions of He^3 in He II

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 6, 1961, 1705 - 1709

TEXT: A study has been made of sound absorption on the basis of the second viscosity. Three-phonon processes and roton-phonon transformation have been studied on impurities. (a) Three-phonon process: According to Ref. 4 (I. M. Khalatnikov, V. N. Zharkov, ZhETF, 32, 1108, 1957),

$$V = -\frac{1}{2}(Pv + vP) + \frac{\partial\Delta}{\partial\rho}\rho' + \frac{1}{2}\frac{\partial^2\Delta}{\partial\rho^2}\rho'^2 + \frac{1}{6}\frac{\partial^3\Delta}{\partial\rho^3}\rho'^3 \quad (2)$$

is valid for the interaction Hamiltonian. The problem then consists in calculating the transition probabilities for the impurities from the state i with momentum P into the state f with P', in which a phonon with momentum p_1 is absorbed and two phonons with momenta p_2 and p_3 are emitted. The

Card 1/7

Theory of sound absorption ...

calculation is then made in accordance with the method given by L. D. Landau and I. M. Khalatnikov in Ref. 5 (ZhETF, 19, 657, 1949). For the element of the transition matrix

$$M \equiv V_{fi} = \frac{A}{c}\left(\frac{p}{2c}\right)^{1/2}(p_1p_2p_3)^{1/2}(M_{12} + M_{13} + M_{23}),$$

где ω_{ik}

$$M_{12} = -\frac{(p_1 - p_2)^2}{p_1p_2\{1 - n_1n_2 + 3\gamma(p_1 - p_2)^2\}}\left\{\frac{P}{p^2}(n_1 + n_2, m)(1 + n_1n_2) - \right. \quad (1)$$
$$\left. - \frac{\partial\Delta}{\partial\rho}\left(\frac{3n_1n_2}{\rho c} - \frac{B}{c^3}\right) + \frac{1}{c}\frac{\partial^2\Delta}{\partial\rho^2}\right\};$$

is valid, where $A = \frac{c^2}{\rho} + \frac{1}{2}\frac{\partial c^2}{\partial\rho}$, $B = \frac{c^2}{\rho} - \frac{\partial c^2}{\partial\rho}$, γ determines the energy ε_{ph} of the phonon as a function of the momentum p $\varepsilon_{ph} = c(p - \gamma n^3)$, $\vec{n}_1$, $\vec{n}_2$, $\vec{n}_3$, $\vec{m}$ are unit vectors in the direction of $\vec{p}_1$, $\vec{p}_2$, $\vec{p}_3$, $\vec{P}$. With the aid of formula

Card 2/7

25193
S/056/61/040/006/014/031
B111/B201

Theory of sound absorption ...

$$W = \int |M|^2 dodo_1 do_2 do_3 = \frac{A^2}{c^2}\left(\frac{p}{2c}\right)^3 \frac{(4\pi)^4}{\theta_T} p_1 p_2 p_3 \left(K + \frac{4P^2}{3p^4}\right) \times$$
$$\times \left\{ \frac{(p_1 - p_2)^2}{p_1^2 p_2^2} + \frac{(p_1 - p_3)^2}{p_1^2 p_3^2} + \frac{(p_2 + p_3)^2}{p_2^2 p_3^2} \right\}, \qquad (3)$$
$$K = \left(\frac{\partial \Delta}{\partial \rho}\right)^2 \left(\frac{3}{p^2 c^2} + \frac{B^2}{c^4}\right) + \frac{1}{c^2}\left(\frac{\partial^2 \Delta}{\partial p^2}\right)^2 + \frac{2B}{c^4}\frac{\partial \Delta}{\partial p}\frac{\partial^2 \Delta}{\partial p^2}.$$

obtained by presupposing $\gamma p^2 \ll 1$ it is possible to derive, according to the perturbation theory, the transition probability $dw = 2\pi\hbar^{-1}|M|^2 \delta(E_f - E_i)\, d\vec{p}_2\, d\vec{p}_3\, (2\pi\hbar)^6$, where E_f and E_i denote the energy of final and initial state, respectively.

$$\dot{N}_\phi = \iiint \{N(P)\, n(p_1)\, [1 + n(p_2)]\, [1 + n(p_3)] -$$
$$- N(P')\, n(p_2)\, n(p_3)\, [1 + n(p_1)]\}\, dw\, dP\, dp_1\, (2\pi\hbar)^{-6}. \qquad (4)$$

Здесь *where*

$$N(P) = (2\pi\hbar)^3 \frac{Np}{m_3} (2\pi mkT)^{-\frac{3}{2}} \exp\left\{-\frac{P^2}{2mkT}\right\}$$

is obtained for the change of the phonon number N_ϕ per unit volume;

Card 3/7

Theory of sound absorption ...

where N(P) is the distribution function of the impurities, n(p) the distribution function of phonons. For small deviations from the position of equilibrium, (4) may be written in the form

$$\dot{N}_\phi = -(2\pi\hbar)^{-12}\frac{\mu_\phi}{kT}\int_0^\infty dP\int_0^\infty dp_2\int_0^\infty dp_3 N(P)\,P^2(p_2+p_3)^2p_2^2p_3^2\times$$
$$\times e^{c(p_2+p_3)/kT}\left[e^{c(p_2+p_3)/kT}-1\right]^{-1}\left[e^{cp_2/kT}-1\right]^{-1}\left[e^{cp_3/kT}-1\right]^{-1}W. \qquad (7)$$

Neglecting one with respect to the e power in the denominator of (7),

$$\dot{N}_\phi = -\Gamma_{\phi l}\mu_\phi, \qquad \Gamma_{\phi l} = x\frac{64\pi^8\beta\rho Q}{(2\pi\hbar)^9 m_3 c^{10}\hbar}\left(\frac{K}{4}+\frac{mkT}{p^4}\right)(kT)^8. \qquad (8)$$

is valid with $\beta = 36.3$, $Q = \frac{A^2}{2}\frac{c}{2c}^3 \cdot \frac{(4\pi)^4}{6}$. The calculations show that the three-phonon contribution to sound absorption is small compared with the five-phonon process or the roton-phonon transformation.

(b) Roton-phonon transformation on impurities: the problem consists in calculating the transition probability from the state with momentum P

Card 4/7

Theory of sound absorption ...

into the state with $\vec{P}'$, in which a phonon with $\vec{p}$ is absorbed and a roton with $\vec{P}_1$ is emitted. $\alpha_{ip} = 2\pi\hbar^{-1}|v_{ip}|^2 \delta(E_1 - E_2)\, d\vec{P}_1/(2\pi\hbar)^3$, where $v_{ip} = 8.10^{-38}$ erg. cm^3 (interaction constant of roton with impurity), E_1 and E_2 denote the energy of initial and final state, respectively. For the change of the total number of rotons N_p, the formulas read:

$$\dot{N}_p = -\dot{N}_\phi = \Gamma_{\phi p i}(\mu_\phi - \mu_p), \qquad (11)$$

where

$$\Gamma_{\phi p i} \leqslant x \frac{2\sqrt{2\pi}}{\hbar^4}|v_{ip}|^2 \frac{P_0^2\Delta_p^2\sqrt{m_p}}{(2\pi\hbar c)^3}\frac{\rho}{m_3}(kT)^{-1/2}e^{-\Delta_p/kT} = 1{,}1\cdot 10^{31} x T^{-1/2} e^{-\Delta_p/kT}. \qquad (11')$$

where μ_p denotes the chemical potential of the roton, and P_0, Δ_p, m_p are the parameters of the roton spectrum. The exact value of $\Gamma_{\phi pi}$ is determined by experiments. According to I. M. Khalatnikov, (ZhETF, 20, 243, 1950),

$$\tilde{\alpha}(0) = \frac{\omega^2}{2\rho c^3}\left[\frac{1}{\Gamma_\phi}\left(\frac{\partial p}{\partial \mu_p} + \frac{\partial p}{\partial \mu_\phi}\right)^2 + \frac{1}{\Gamma_{\phi p}}\left(\frac{\partial p}{\partial \mu_p}\right)^2\right]_{s.s.}, \qquad (12)$$

Card 5/7

Theory of sound absorption ...

is valid for the sound absorption coefficient in pure helium II, where S_0 denotes the entropy of the unit mass of pure helium II. For not too high concentrations,

$$\tilde{\alpha}(x) = \frac{\omega^2}{2\rho c^3}\left[\frac{1}{\Gamma_\Phi + \Gamma_{\Phi\prime}}\left(\frac{\partial\rho}{\partial\mu_p} + \frac{\partial\rho}{\partial\mu_\Phi}\right)^2 + \frac{1}{\Gamma_{\Phi p} + \Gamma_{\Phi p\prime}}\left(\frac{\partial\rho}{\partial\mu_p}\right)^2\right]_{\rho, S, x}. \quad (15)$$

may be written for the sound absorption coefficient of a solution, where S denotes the entropy of the unit mass of the solution. On the basis of papers by I. M. Khalatnikov (ZhETF, 20, 243, 1950)

$$\left(\frac{\partial\rho}{\partial\mu_p}\right)_0 = -N_p\left[\frac{\Delta_p}{T}\left(\frac{N_p}{N_\Phi} - 23{,}2\right) - 22{,}5\right] \Big/ c^2\left[\left(\frac{\Delta_p^2}{T^2} + \frac{\Delta_p}{T} + \frac{3}{4}\right)\frac{N_p}{N_\Phi} + \frac{\pi^4}{9}\right], \quad (18)$$

$$\left(\frac{\partial\rho}{\partial\mu_\Phi}\right)_0 = -N_p\left[6{,}4\,\frac{\Delta_p^2}{T^2} + 9{,}4\,\frac{\Delta_p}{T} + 9{,}3\right] \Big/ c^2\left[\left(\frac{\Delta_p^2}{T^2} + \frac{\Delta_p}{T} + \frac{3}{4}\right)\frac{N_p}{N_\Phi} + \frac{\pi^4}{9}\right].$$

holds. With (18) the sound absorption coefficient becomes

$$\tilde{\alpha}(x) = \frac{\omega^2 c}{2\rho}\left[\frac{1}{\Gamma_\Phi + \Gamma_{\Phi\prime}}\left[\left(\frac{\partial\rho}{\partial\mu_p}\right)_0 + \left(\frac{\partial\rho}{\partial\mu_\Phi}\right)_0\right]^2 + \frac{1}{\Gamma_{\Phi p} + \Gamma_{\Phi p\prime}}\left(\frac{\partial\rho}{\partial\mu_p}\right)_0^2\right]. \quad (19)$$

Card 6/7 —

25193

S/056/6 /040/006/0'4/03
B /B2

Theory of sound absorption . . .

Results have been compared with experiments by G. O. Harding and J. Wilks (Phyl. Mag. 3, 469, 1958), and it is stated that
$K\varsigma^4 = 5.3 \cdot 10^{-52} g^2 cm^2 sec^{-2}$, Γ_{ϕ_F} = x · 9.7 · $10^{9} T^{1/2} e^{-\Delta_F/T}$.
I. M. Khalatnikov is thanked for his assistance, and V. N. Zharkov for valuable advice. There are 1 figure and 7 references: 5 Soviet-bloc and 2 non-Soviet bloc.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems, Academy of Sciences USSR)

SUBMITTED: November 0, 1960 (initially)
February 8, 196 (after revision)

Card 7/7

39681
S/056/62/043/001/056/056
B102/B104

24.1200

AUTHOR: Andreyev, A. F.

TITLE: Anomalous sound reflection from a metallic surface at low temperatures

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 1(7), 1962, 358-360

TEXT: It is shown that under certain conditions the conduction electrons may change the reflection coefficient of sound coming from a liquid and striking the metal surface. For a plane sound wave the field in the liquid (in the semispace $z > 0$) is described by the scalar potential φ: $\vec{V} = \text{grad}\,\varphi$, and in the metal by the scalar potential Φ and the vectorial potential $\vec{\Psi}$: $\vec{u} = \text{grad}\,\Phi + \text{curl}\,\vec{\Psi}$, $\vec{u}$ - displacement vector. The wave vector $\vec{k}$ of the sound (frequency ω, angle of incidence θ) is assumed to lie in the xz-plane. Then the sonic field is given by

Card 1/4

$$\varphi = \{A_0 \exp [ik (x \sin\theta - z \cos\theta)] + A \exp [ik (x \sin\theta + z \cos\theta)]\} e^{-i\omega t}$$
$$\Phi = A_l \exp \{ik_l (x \sin\theta_l - z \cos\theta_l) - i\omega t\},$$
$$\Psi = A_t \exp \{ik_t (x \sin\theta_t - z \cos\theta_t) - i\omega t\},$$
$$k = \frac{\omega}{c}, \quad k_l = \frac{\omega}{c_l}, \quad k_t = \frac{\omega}{c_t}; \quad \frac{\sin\theta}{c} = \frac{\sin\theta_l}{c_l} = \frac{\sin\theta_t}{c_t}, \qquad (1)$$

where c is the sonic velocity in the liquid, c_l and c_t are longitudinal and transverse components in the metal; $c < c_t$. The corresponding amplitudes A, A_l, A_t are determined from the boundary conditions. A_l and A_t show a distinct maximum if $\theta \approx \theta_1$, with $\sin\theta_1 = c/c_t \xi$, $\xi = \xi (c_t/c_l) \sim 1$. If $\theta > \theta_0$ with $\sin\theta_0 = c/c_t$ inner total reflection occurs. θ_1 lies within the region of inner total reflection. If $\omega\tau \ll 1$ (τ - electron mean free time) and $v_0 \gg c_t/\omega$ (v_0 - Fermi velocity), for $\theta = \theta_1$, the system of equations of the boundary conditions has the solutions

Card 2/4

terms of the denominators in (2)-(4) vanish. $|A/A_0|^2$ as a function of θ has a sharp minimum at θ_1; right and left from θ_1 it equals 1, below θ_0 it is smaller than 1. If $v_0\tau \ll c_t/\omega$ the electrons have only a very small influence on the reflection coefficient. If a strong magnetic field is applied in parallel to the metal surface and perpendicularly to the plane of incidence of the sound wave an effect similar to cyclotron resonance will arise. There is 1 figure.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR
(Institute of Physical Problems of the Academy of Sciences USSR)

SUBMITTED: May 31, 1962

Card 4/4

L1163
S/056/62/043/004/054/061
B104/B186

AUTHOR: Andreyev, A. F.

TITLE: The effect of conduction electrons on the Kapitsa jump in temperature

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 4(10), 1962, 1535-1542

TEXT: I. M. Khalatnikov (ZhETF, 22, 667, 1952) has proved that the heat flux Q and the jump in temperature discovered by P. L. Kapitsa (ZhETF, 11, 1, 1941) which occurs along the boundary between a solid and a liquid when heat flows through the boundary are related by

$$Q = \frac{\varrho}{D} c \frac{16\pi^5}{15} \frac{T^3 \Delta T}{(2\pi\hbar c_t)^3} F\left(\frac{c_t}{c_l}\right) \quad (1),$$

where ϱ and c are the density and the velocity of sound within the liquid whilst D, c_l and c_t are the density and the velocity of longitudinal and

Card 1/4

The effect of conduction electrons ...

transverse sound waves within the solid and F(x) is a definite function. Since the heat exchange between the solid and the liquid (He^4 or He^3) consists mainly in the absorption and emission of phonons, the heat flux is determined mainly by the coefficient of sound reflection from the solid. The effect of conduction electrons on the sound reflection coefficient is studied. A plane sound wave emerging from a liquid which occupies the half-space $z > 0$ falls upon a metal. Within the liquid $\vec{V} = \mathrm{grad}\varphi$ holds; within the solid: $\vec{u} = \mathrm{grad}\Phi + \mathrm{rot}\vec{\Psi}$, where $\vec{V}$ is the velocity field and $\vec{u}$ is the displacement vector.

$$\varphi = \{A_0 \exp\{ik(x\sin\theta - z\cos\theta)\} + A\exp\{ik(x\sin\theta + z\cos\theta)\}\}e^{-i\omega t}$$
$$\Phi = A_l \exp\{ik_l(x\sin\theta_l - z\cos\theta_l) - i\omega t\}, \qquad (2)$$
$$\Psi = A_t \exp\{ik_t(x\sin\theta_t - z\cos\theta_t) - i\omega t\},$$

$$k = \frac{\omega}{c}, \quad k_l = \frac{\omega}{c_l}, \quad k_t = \frac{\omega}{c_t}; \quad \frac{\sin\theta}{c} = \frac{\sin\theta_l}{c_l} = \frac{\sin\theta_t}{c_t}.$$

is valid when the sound having the audio-frequency ω impinges at an angle θ. When absorption within the metal is neglected,

Card 2/4

The effect of conduction electrons ...

$$\frac{A}{A_0} = \frac{Z_l\cos^2 2\theta_t + Z_t\sin^2 2\theta_t - Z}{Z_l\cos^2 2\theta_t + Z_t\sin^2 2\theta_t + Z},$$

$$\frac{A_l}{A_0} = \frac{p}{D}\frac{2Z_l\cos 2\theta_t}{Z_l\cos^2 2\theta_t + Z_t\sin^2 2\theta_t + Z}, \qquad (3)$$

$$\frac{A_t}{A_0} = -\frac{p}{D}\frac{2Z_t\sin 2\theta_t}{Z_l\cos^2 2\theta_t + Z_t\sin^2 2\theta_t + Z},$$

$$Z_l = \frac{Dc_l}{\cos\theta_l}, \quad Z_t = \frac{Dc_t}{\cos\theta_t}, \quad Z = \frac{\rho c}{\cos\theta}.$$

is valid. As can be seen from (3), the vibration amplitudes within the metal have narrow maxima if the condition $Z_l\cos^2 2\theta_t + Z_t\sin^2\theta_t$ is satisfied. The corresponding angle of incidence lies within the range of total internal reflection, and Rayleigh surface waves propagate within the metal. The effect of absorption within the metal on the reflection

Card 3/4

ANDREYEV, A.F.

Uniqueness theorem for a normal Frommer region of the second type. Dokl. AN SSSR 142 no.4:754-757 F '62. (MIRA 15:2)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A.Steklova AN SSSR. Predstavleno akademikom V.I.Smirnovym. (Differential equations)

ANDREYEV, A.F.

Anomalous sound reflection from a metal surface at low temperatures. Zhur. eksp. i teor. fiz. 43 no.1:358-360 Jl '62. (MIRA 15:9)

1. Institut fizicheskikh problem AN SSSR.
(Sound waves) (Metals at low temperatures)

ANDREYEV, A.F.

Strengthening the uniqueness theorem for the O-curve in N_2. Dokl. AN SSSR 146 no.1:9-10 S '62. (MIRA 15:9)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A. Steklova AN SSSR. Predstavleno akademikom V.I. Smirnovym.
(Differential equations)

ANDREYEV, A.F.

Effect of conducting electrons on the Kapitsa temperature jump. Zhur. eksp. i teor. fiz. 43 no.4:1535-1542 O '62. (MIRA 15:11)

1. Institut fizicheskikh problem AN SSSR.
(Electrons)
(Superconductivity)

ANDREYEV, A.F.

Stability of laminar flow of thin liquid films. Zhur. eksp. i teor. fiz. 45 no.3:755-759 S '63. (MIRA 16:10)

1. Institut fizicheskikh problem AN SSSR.
(Fluid dynamics)

ACCESSION NR: AP4009133 S/0056/63/045/006/2064/2066

AUTHOR: Andreyev, A. F.

TITLE: Singularity of thermodynamic quantities at the first-order phase transition point

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 45, no. 6, 1963, 2064-2066

TOPIC TAGS: phase transition, first order phase transition, thermodynamic quantities, thermodynamic singularity, boiling point singularity, boiling liquid, thermodynamic potential, gas bubble formation, gas bubble formation fluctuation

ABSTRACT: Developing an idea first expressed by L. P. Pitayevskiy, that a first-order phase transition point must be singular for thermodynamic quantities, the author shows that the thermodynamic potential of a liquid has a singularity at the boiling point. It is de-

Card 1/2

ACCESSION NR: AP4009133

monstrated in particular that the gas bubbles forming in a liquid introduce a finite contribution to the thermodynamic potential at the liquid below the boiling point, but cause instability of the liquid phase above the boiling point, making the boiling point a singular point for the thermodynamic functions of the liquid. This is confirmed by calculations of the total contribution of the bubbles to the thermodynamic potential. It is shown further that this singularity is very weak so that all the derivatives of the potential with respect to the temperature remain finite, and apparently cannot be observed experimentally. The mechanism producing the singularity is fluctuation formation of the gas bubbles. "In conclusion I express my gratitude to L. P. Gor'kov, L. P. Pitayevskiy, and I. M. Khalatnikov for helpful discussion. Orig. art. has: 9 formulas.

ASSOCIATION: Institut fizicheskikh problem AN SSSR (Institute of Physics Problems AN SSSR)

SUBMITTED: 04Jul63 DATE ACQ: 02Feb64 ENCL: 00

SUB CODE: PH NO REF SOV: 001 OTHER: 000

Card 2/2

ANDREYEV, A.F.; FAL'KOVSKIY, L.A.

All-Union Conference on Low Temperature Research. Vest. AN SSSR 33 no.10:99-100 O '63. (MIRA 16:11)

ANDREYEV, A.F.

Singularity of thermodynamic quantities at the point of a phase transition of the first order. Zhur. eksp. i teor. fiz. 45 no.6:2064-2066 D '63. (MIRA 17:2)

1. Institut fizicheskikh problem AN SSSR.

ACCESSION NR: AP4031169 S/0056/64/046/004/1456/1460

AUTHOR: Andreyev, A. F.

TITLE: Properties of rotating liquid helium in the vicinity of the Lambda point

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1456-1460

TOPIC TAGS: helium, liquid helium, Lambda point, superfluidity, Onsager Feynman vortex, vortex filament, superfluid vortex filament, normal vortex filament, rotating liquid helium

ABSTRACT: In view of recent disclosure (E. L. Andronikashvili et al., paper at Tenth All-Union Conference on Low-Temperature Physics, Moscow, 1963) that the elastic properties of liquid helium are retained for a rather long time when the helium is heated above the λ point, it is shown theoretically that this phenomenon is caused by the formation in the heated rotating liquid helium of vortex filaments of

Card 1/3

ACCESSION NR: AP4031169

two types, superfluid and normal. The former has a circulation $2\pi\hbar/m$ and the latter has a circulation $(\Delta\zeta_s/\zeta_n)2\pi\hbar/m$ (ζ -- density, m -- mass of atom of liquid). A complete system of hydrodynamic equations is obtained for the helium containing the two types of vortices, and the lifetime of the normal vortex filaments is estimated. The theoretical lifetime of approximately 7 min at a circular frequency 10^{-2} agrees with the cited experiments. A dispersion law is derived for elastic oscillations of a system of "normal" vortex filaments. This dispersion law agrees with experiments on the oscillations of a disc in rotating liquid helium. "I am grateful to I. M. Khalatnikov and L. P. Pitayevskiy for a discussion of the present results." Orig. art. has: 29 formulas.

ASSOCIATION: Institut fizicheskikh problem AN SSSR (Institute of Physics Problems, AN SSSR)

Card 2/3